

2023 See <https://www.spaceweather.com>  
<https://www.spaceweatherlive.com/en.html>  
<https://www.nesdis.noaa.gov/news/time-lapse-of-solar-cycle-25-displays-increasing-activity-the-sun>

**January** - многочисленные С и М вспышки

**3 Jan** SIGNIFICANT FARSIDE SOLAR EXPLOSION  
[https://www.spaceweather.com/images2023/03jan23/farside\\_cme.gif](https://www.spaceweather.com/images2023/03jan23/farside_cme.gif)  
[shock waves from the blast](#) wrapping around both of the sun's poles  
It will [narrowly miss our planet](#)

### Correlation of Coronal Mass Ejection Shock Temperature with Solar Energetic Particle Intensity

Manuel Enrique [Cuesta](#), [D. J. McComas](#), [L. Y. Khoo](#), [R. Bandyopadhyay](#), [T. Sharma](#), +++  
ApJ 2024  
<https://arxiv.org/pdf/2402.00210.pdf>

### Solar Radio Imaging at Arecibo: The Brightness Temperature and Magnetic Field of Active Regions

[P. K. Manoharan](#), [C. J. Salter](#), [S. M. White](#), [P. Perillat](#), [F. Fernandez](#), [B. Perera](#), [A. Venkataraman](#), [C. Brum](#)  
Solar Phys. 2023  
<https://arxiv.org/pdf/2307.00328.pdf>

**4 Jan** GEOSTORM Kp=5 Dst=- 61 Bz~-11 due to effects from CH1123.  
A CME from 30 Dec hit Earth's magnetic field at 02:54.

**5 Jan** Небольшое (Dst~ -29) усиление бури due to weak CME effects

**5-9 Jan**

### Longitudinal Extent of 3He-rich Solar Energetic Particle Events Near 1 au

George C. [Ho](#)<sup>1</sup>, Glenn M. [Mason](#)<sup>2</sup>, Robert C. [Allen](#)<sup>1</sup>, Athanasios [Kouloumvakos](#)<sup>2</sup>, Robert F. [Wimmer-Schweingruber](#)<sup>3</sup>, and Javier [Rodríguez-Pacheco](#)<sup>4</sup>  
2024 ApJ 974 68  
<https://iopscience.iop.org/article/10.3847/1538-4357/ad67ce/pdf>

**6 Jan** ~01 UT: Короткая X1.2 вспышка в вышедшей из-за SE лимба AR3182, S15~570  
[https://www.spaceweather.com/images2023/06jan23/x1p2\\_strip\\_opt.gif](https://www.spaceweather.com/images2023/06jan23/x1p2_strip_opt.gif); [movie](#)  
A dome of glowing-hot plasma hovered above the blast site for more than an hour, no CME.

### The Tests and Calibrations of the Hard X-ray Imager Aboard ASO-S.

[Su](#), Y., [Zhang](#), Z., [Chen](#), W. et al.  
Sol Phys 299, 153 (2024).  
<https://doi.org/10.1007/s11207-024-02392-x>  
<https://link.springer.com/content/pdf/10.1007/s11207-024-02392-x.pdf>

### Multiwavelength Observations of Quasiperiodic Pulsations in the Impulsive Phase of an Eruptive Flare with the Hard X-Ray Imager On Board ASO-S and Other Instruments.

[Shi](#), F., [Li](#), D., [Ning](#), Z. et al.  
Sol Phys 299, 30 (2024).

<https://doi.org/10.1007/s11207-024-02272-4>

**6-12 Jan**

**Solar Active Regions Emergence Prediction Using Long Short-Term Memory Networks**

[Spiridon Kasapis](#), [Irina N. Kitiashvili](#), [Alexander G. Kosovichev](#), [John T. Stefan](#)

ApJ 2024

<https://arxiv.org/pdf/2409.17421>

**9 Jan** 18:50 - Impulsive **X1.9/3B** flare, S14E72, AR3184, no CME, S9~480

**Solar Atmospheric Oscillations as Measured by the GOES-R Series EXIS EUVS-C Instrument**

Thomas D. **Eden Jr.**<sup>1</sup>, Francis. G. Eparvier<sup>1</sup>, Andrew R. Jones<sup>1</sup>, William E. McClintock<sup>1</sup>, Donald L. Woodraska<sup>1</sup>, Tom Woods<sup>1</sup>, and Martin Snow<sup>2</sup>

2024 ApJL 973 L18

<https://iopscience.iop.org/article/10.3847/2041-8213/ad73d9/pdf>

**11 Jan** 08:33 - M3.1 flare in AR3186, N23E66, partial halo CME  
21 UT - C8/1N flare in AR3184 S14E38, partial halo CME

**A New 6–15 GHz Solar Radio Observation System**

Lei **Zhang**, Yanrui Su, Zhao Wu, Shuwang Chang, Yao Chen, and Fabao Yan

2023 ApJS 268 27

<https://iopscience.iop.org/article/10.3847/1538-4365/ace7cc/pdf>

**13 Jan** Небольшое (J10~4.5) мягкое возрастание потока протонов; behind SW limb, C8.5 LDE, large CME

**13-14 Jan** **GEOSTORM Kp=4 Dst=- 38 Bz~-11** due to one or both of the CMEs observed on January 11

**14 Jan** 21 UT - [dramatic twisting eruption](#) in the magnetic canopy of SW AR3182.  
Вечером M5 SW LDE flare A partial halo [CME](#)

**15 Jan** Two peak **GEOSTORM Kp=5 Dst=- 55 Bz~-10** due to one or both of the CMEs observed on January 11; M6 and M4.8 E flares

**17-18 Jan** **GEOSTORM Kp=4 Dst=- 30 Bz~-10** due to CME of 14 Jan

**GIANT SUNSPOT in the middle of the sun AR3290**

**19 Jan** enormous transequator plasma discharge between AR3192 and AR3190

<https://www.spaceweather.com/images2023/19jan23/lightningbolt.gif>

**20 Jan** ~12 UT – Эволюция и значительная эрупция большого SSW волокна, apparently triggered a C5 flare in AR 13190 at 14:07 UT, **large partial halo CME**

<https://www.spaceweatherlive.com/en/solar-activity/latest-cmes.html#21-1>

Березин И.А., Тлатов А.Г. Наблюдения начальной стадии эрупции волокон  
Восемнадцатая ежегодная конференция ИКИ 2023

**24 Jan** NW filament eruptions

**29-31 Jan** – Несколько значительных CMEs [watch this movie](#) Comet 96P/Machholz is streaking toward the sun for a close encounter inside the orbit of Mercury.

## Февраль- Март

### РАДИОПРЕДВЕСТНИКИ КОРОНАЛЬНЫХ ВЫБРОСОВ МАССЫ, ЗАРЕГИСТРИРОВАННЫХ В ФЕВРАЛЕ - МАРТЕ 2023 ГОДА

ШЕЙНЕР О.А.<sup>1</sup>, ФРИДМАН В.М.<sup>1</sup>

КОСМИЧЕСКИЕ ИССЛЕДОВАНИЯ Том: 62Номер: 2 Год: 2024 Страницы: 157-167

## 1 Feb-30 Jun

### Estimates of Spherical Satellite Drag Coefficients in the Upper Thermosphere During Different Geomagnetic Conditions

[Xin Wang](#), [Tingling Ren](#), [Ronglan Wang](#), [Bingxian Luo](#), [Ercha Aa](#), [Lei Cai](#), [Ming Li](#), [Juan Miao](#), [Siqing Liu](#), [Jiancun Gong](#)

Space Weather [Volume22, Issue11](#) November 2024 e2024SW003974

<https://doi.org/10.1029/2024SW003974>

<https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2024SW003974>

## 5 Feb

### Spatial and Spectral Evolution of Microwave and X-Ray Sources During the Solar Limb Flare on February 5, 2023.

Shamsutdinova, J.N., Kashapova, L.K., Li, Z. et al.

Sol Phys 299, 80 (2024).

<https://doi.org/10.1007/s11207-024-02331-w>

### A New 6–15 GHz Solar Radio Observation System

Lei Zhang, Yanrui Su, Zhao Wu, Shuwang Chang, Yao Chen, and Fabao Yan

2023 ApJS 268 27

<https://iopscience.iop.org/article/10.3847/1538-4365/ace7cc/pdf>

**6-7...11 Feb** **GEOSTORM**  $K_p=4$   $Dst=-34$   $B_z\sim-7$  effects from CH1129

**7-.... Feb** [the suddenly active sun](#) is averaging four M-flares a day.

### High-altitude Spider-type Prominence above the Magnetic Null Point

Boris **Filippov**

2023 ApJ 958 184

<https://iopscience.iop.org/article/10.3847/1538-4357/ad02f9/pdf>

## 7-21 Feb

### High-altitude Spider-type Prominence above the Magnetic Null Point

Boris **Filippov**

2023 ApJ 958 184

<https://iopscience.iop.org/article/10.3847/1538-4357/ad02f9/pdf>

## 8 Feb

### Kink-and-Disconnection Failed Eruption in 3D.

Mrozek, T., Li, Z., Karlický, M. et al.

Sol Phys 299, 81 (2024).

<https://doi.org/10.1007/s11207-024-02325-8>

<https://link.springer.com/content/pdf/10.1007/s11207-024-02325-8.pdf>

**10 Feb** 03:03 – NW AR3213 M3.7-class flare and a shock, type II

<https://www.spaceweather.com/images2023/10feb23/tsunami.gif>

~09 UT – эрупция SW волокна Movies: [global](#), [regional](#). [CME leaving the sun](#)

**11 Feb** 10:50 – filament eruption [explosion](#) to the east of NW/center AR 13216, halo CME [movie](#)  
15:48 – impulsive X1.1 flare from SE AR3217, S5~260

**A Statistical Study of Solar White-Light Flares Observed by the White-light Solar Telescope of the Lyman-alpha Solar Telescope on the Advanced Space-based Solar Observatory (ASO-S/LST/WST) at 360 nm**

[Zhichen Jing](#), [Ying Li](#), [Li Feng](#), [Hui Li](#), [Yu Huang](#), [Youping Li](#), +++

Solar Phys. 2024

<https://arxiv.org/pdf/2401.07275.pdf>

**12 Feb**

**The observational evidence that all microflares that accelerate electrons to high-energies are rooted in sunspots**

[Andrea Francesco Battaglia](#), [Säm Krucker](#), [Astrid M. Veronig](#), [Muriel Zoë Stiefel](#), [Alexandar Warmuth](#), [Arnold O. Benz](#), [Daniel F. Ryan](#), [Hannah Collier](#), [Louise Harra](#)

A&A 2024

<https://arxiv.org/pdf/2409.14466>

**13 Feb**

**Development of a 90–600 MHz Meter-wave Solar Radio Spectrometer**

ShuWang [Chang](#)<sup>1,2</sup>, Bing Wang<sup>1</sup>, Guang Lu<sup>1</sup>, YuPeng Shen, +++

2024 ApJS 272 21

<https://iopscience.iop.org/article/10.3847/1538-4365/ad3de7/pdf>

**15 Feb GEOSTORM Kp=5.3 Dst=- 69 Bz~-17**, arrival of the February 11 CME  
~01 UT - Transequatorial E/center filament [eruption](#) loosely connected to ARs 3220 and 3226, partial halo [CME](#)

**High-altitude Spider-type Prominence above the Magnetic Null Point**

Boris [Filippov](#)<sup>1</sup>

2023 ApJ 958 184

<https://iopscience.iop.org/article/10.3847/1538-4357/ad02f9/pdf>

**16 Feb** ~10 UT – NW filament eruption

**17 Feb** 20:16 **X2.2/2B LDE flare in NE AR 13229 N25E64**, S9~2000, [type II](#), **a very fast and wide full halo** CME [https://www.spaceweather.com/images2023/17feb23/x2\\_cme.gif](https://www.spaceweather.com/images2023/17feb23/x2_cme.gif)

**ИСТОЧНИКИ СОЛНЕЧНЫХ ПРОТОНОВ В СОБЫТИЯХ 24-25 ФЕВРАЛЯ И 16-17 ИЮЛЯ 2023 ГОДА**

[СТРУМИНСКИЙ А.Б.](#)<sup>✉</sup>, [САДОВСКИЙ А.М.](#)<sup>1</sup>, [ГРИГОРЬЕВА И.Ю.](#)<sup>2</sup>

КОСМИЧЕСКИЕ ИССЛЕДОВАНИЯ Том: 62 Номер: 2 Год: 2024 Страницы: 188-200

**Thermal Properties of Current Sheet Plasmas in Solar Flares**

[Tingyu Gou](#), [Katharine K. Reeves](#)

ApJ 2024

<https://arxiv.org/pdf/2407.01833>

**Sources of Solar Protons in the Events of February 24-25 and July 16-17, 2023**

[Struminsky](#), [AB](#) ; [Sadovskii](#), [AM](#) ; [Grigorieva](#), [IY](#)

Cosmic Research Volume 62 Issue 2 Page 133-146 2024

**20-22 Feb** NE AR3234 is crackling with short-term [multiple M4-M5 flares](#) without microwave and protons [non-stop fusillade](#)

**20 Feb – 5 Mar** more than 20 radio blackouts many flares  
<https://www.nesdis.noaa.gov/news/time-lapse-of-solar-cycle-25-displays-increasing-activity-the-sun>

**21 Feb GEOSTORM Kp=4 Dst=- 58 Bz~-12**

### **An Overview of Solar Orbiter Observations of Interplanetary Shocks in Solar Cycle 25 Review**

D. Trotta, [A. Dimmock](#), [H. Hietala](#), [X. Blanco-Cano](#), [T. S. Horbury](#), +++  
ApJ 2024  
<https://arxiv.org/pdf/2410.24007>

**22 Feb**

### **Correction for the Weakening Magnetic Field within the Sunspot Umbra Observed by ASO-S/FMG**

[Haiqing Xu](#), [Jiangtao Su](#), [Suo Liu](#), [Yuanyong Deng](#), [Xianyong Bai](#), [Jie Chen](#), [Xiaofan Wang](#), [Xiao Yang](#), [Yongliang Song](#)  
Solar Phys. 2024  
<https://arxiv.org/pdf/2405.18699>

**23 Feb GEOSTORM Kp=4,5 Dst=- 33 Bz~-9**

**A DANGEROUS** Active sunspot AR3234  
<https://www.spaceweather.com/images2023/23feb23/evolution.gif>

**24 Feb** 19:50 - **NW filament eruption** connected to AR3229, **304 A**  
<https://www.spaceweather.com/images2023/24feb23/slice.gif> , radio S3~230,  
**20:30 - M3 LDE flare** , 2B, radio S3~230, II/IV, **lopsided halo CME**  
[https://www.spaceweather.com/images2023/24feb23/cme\\_c3\\_anim\\_opt.gif](https://www.spaceweather.com/images2023/24feb23/cme_c3_anim_opt.gif)  
SEP **protons** J10~3.1

Возможно, эрупция волокна **спровоцировала** обширную вспышку и удалённый **ДИММИНГ**

### **Sources of Solar Protons in the Events of February 24-25 and July 16-17, 2023**

Struminsky, AB ; Sadvovskii, AM ; Grigorieva, IY  
Cosmic Research Volume 62 Issue 2 Page 133-146 2024  
DOI 10.1134/S0010952523600300

**25 Feb** 19:44 – **M6.3/3N LDE flare**, **eruption** , AR3229, N26W43, S3~500, **halo CME** , SEP **protons** J10~34→58(ESP) X class flare  
<https://www.nesdis.noaa.gov/news/time-lapse-of-solar-cycle-25-displays-increasing-activity-the-sun>

### **ИСТОЧНИКИ СОЛНЕЧНЫХ ПРОТОНОВ В СОБЫТИЯХ 24-25 ФЕВРАЛЯ И 16-17 ИЮЛЯ 2023 ГОДА**

СТРУМИНСКИЙ А.Б.✉<sup>1</sup>, САДОВСКИЙ А.М.<sup>1</sup>, ГРИГОРЬЕВА И.Ю.<sup>2</sup>  
КОСМИЧЕСКИЕ ИССЛЕДОВАНИЯ Том: 62Номер: 2 Год: 2024 Страницы: 188-200

## Observation of solar energetic particles with Metis on board Solar Orbiter on February 25, 2023

C. Grimani<sup>1,2</sup>, M. Fabi<sup>1,2</sup>, A. Persici<sup>3,4</sup>, F. Sabbatini<sup>1,2</sup>, M. Villani<sup>1</sup>, +

A&A, 686, A74 (2024)

<https://www.aanda.org/articles/aa/pdf/2024/06/aa49386-24.pdf>

## Sources of Solar Protons in the Events of February 24-25 and July 16-17, 2023

Struminsky, AB ; Sadovskii, AM ; Grigorieva, IY

Cosmic Research Volume 62 Issue 2 Page 133-146 2024

DOI 10.1134/S0010952523600300

## The solar cycle 25 multi-spacecraft solar energetic particle event catalog of the SERPENTINE project

N. Dresing, A. Yli-Laurila, S. Valkila, J. Gieseler, D. E. Morosan, G. U. Farwa, +

A&A 2024

<https://arxiv.org/pdf/2403.00658.pdf>

<https://data.serpentine-h2020.eu/catalogs/sep-sc25/> **catalog**

## The Magnetic Field Calibration of the Full-Disk Magnetograph onboard the Advanced Space based Solar Observatory (ASO-S/FMG)

S. Liu, J.T. Su, X.Y. Bai, Y.Y. Deng, J. Chen, Y.L. Song, X.F. Wang, H.Q. Xu, X. Yang

2023

<https://arxiv.org/pdf/2312.00319.pdf>

**26-27 Feb** **G2 G3**-class (Moderate Strong) **GEOSTORM** **Kp=7** **Dst=-138** **Bz~-18**, the arrival of the February 24 and 25 CMEs.

<https://www.spaceweather.com/images2023/27feb23/twocmes.jpg>

See <https://www.swpc.noaa.gov/news/g3-strong-geomagnetic-storm-conditions-observed-feb-27>

## On the Most Interesting Solar-Wind and Cosmic-Ray Events in February–April 2023.

Belov, S.M., Shlyk, N.S., Abunina, M.A. et al.

Sol Phys 299, 164 (2024).

<https://doi.org/10.1007/s11207-024-02406-8>

**28 Feb** 17:50 - **M8.6 impulsive flare** [movie](#), NW AR3234, N26W31, S9~370, слабый CME, без протонов

See <https://www.swpc.noaa.gov/news/r2-moderate-radio-blackout-observed-0>

## Sources of Solar Protons in the Events of February 24-25 and July 16-17, 2023

Struminsky, AB ; Sadovskii, AM ; Grigorieva, IY

Cosmic Research Volume 62 Issue 2 Page 133-146 2024

DOI 10.1134/S0010952523600300

**2 March** 21:16 – **M3.8 almost impulsive flare** AR 13234 N20W65, coronal wave, dimming, без протонов

**2-6 Mar** **GEOSTORM** **Kp=4,2** **Dst=- 47** **Bz~-8**

**3 Mar** ~17:50 – **X2/1B flare almost impulsive flare** **одновременно** в AR 3234 (N22W80) и в AR 3242 (N11E53), **gamma**, общее радио S5~1300, see [CME movie](#)

## The White-light Emissions in Two X-class Flares Observed by ASO-S and CHASE

[Ying Li](#), [Zhichen Jing](#), [De-Chao Song](#), [Qiao Li](#), [Jun Tian](#), [Xiaofeng Liu](#), [Ya Wang](#), [M. D. Ding](#), [Andrea Francesco Battaglia](#), [Li Feng](#), [Hui Li](#), [Weiqun Gan](#)  
ApJ 2024  
<https://arxiv.org/pdf/2402.07374.pdf>

### Spectroscopic Observations of Coronal Rain Formation and Evolution following an X2 Solar Flare

[David H. Brooks](#), [Jeffrey W. Reep](#), [Ignacio Ugarte-Urra](#), [John E. Unverferth](#), [Harry P. Warren](#)  
ApJ 962 105 2024  
<https://arxiv.org/pdf/2401.04537.pdf>  
<https://iopscience.iop.org/article/10.3847/1538-4357/ad18be/pdf>

### Simultaneous detection of flare-associated kink oscillations and extreme-ultraviolet waves

[Dong Li](#), [Zhenyong Hou](#), [Xianyong Bai](#), [Chuan Li](#), [Matthew Fang](#), [Haisheng Zhao](#), [Jincheng Wang](#), [Zongjun Ning](#)  
Science China Technological Sciences 2023  
<https://arxiv.org/pdf/2311.08767.pdf>

**4 Mar** 15:57 – M5.2 NW-limb flare, S5~280, II/IV, без протонов  
NE AR 3242 explosion

[https://www.spaceweather.com/images2023/04mar23/m1anim\\_strip\\_opt.gif](https://www.spaceweather.com/images2023/04mar23/m1anim_strip_opt.gif)

**5 Mar** 21:36 - NW M5.0 impulsive flare AR3243, S5~150, II/IV bursts, слабый CME

**6 Mar** 02:28 – NW M5.8-flare explosion AR3243 LDE? S5~900 CME

[https://www.spaceweather.com/images2023/06mar23/m6\\_teal\\_anim.gif](https://www.spaceweather.com/images2023/06mar23/m6_teal_anim.gif)  
[https://www.spaceweather.com/images2023/06mar23/cme\\_anim.gif](https://www.spaceweather.com/images2023/06mar23/cme_anim.gif)

### Inter-planetary type-IV solar radio bursts: A comprehensive catalog and statistical results

[Atul Mohan](#), [Nat Gopalswamy](#), [Anshu Kumari](#), [Sachiko Akiyama](#), [Sindhuja G](#)  
ApJ 2024  
<https://arxiv.org/pdf/2406.00194>

### Electron acceleration and transport in the 2023-03-06 solar flare

[Alexey Kuznetsov](#), [Zhao Wu](#), [Sergey Anfinogentov](#), [Yang Su](#), [Yao Chen](#)  
Frontiers in Astronomy and Space Sciences 11: 1407955. 2024  
doi: 10.3389/fspas.2024.1407955  
<https://arxiv.org/pdf/2405.18850>  
<https://www.frontiersin.org/journals/astronomy-and-space-sciences/articles/10.3389/fspas.2024.1407955/full>

**7 Mar**

### Tracking an eruptive prominence using multiwavelength and multiview observations on 2023 March 7

[Qingmin Zhang](#), [Yudi Ou](#), [Zhenghua Huang](#), [Yongliang Song](#), [Suli Ma](#)  
ApJ 2024  
<https://arxiv.org/pdf/2410.22724>

**9 Mar** короткая **GEOSTORM** на возмущённом фоне  $K_p=4$   $Dst=-51$   $B_z--8$   
Morning strange **BUTTERFLY** farside CME

<https://www.spaceweather.com/images2023/10mar23/butterfly2.gif>

### Formation and Evolution of Transient Prominence Bubbles Driven by Erupting Mini-filaments

[Yilin Guo](#), [Yijun Hou](#), [Ting Li](#), [Yuandeng Shen](#), [Jincheng Wang](#), [Jun Zhang](#), [Jianchuan Zheng](#), [Dong Wang](#), [Lin Mei](#)

ApJ 2024  
<https://arxiv.org/pdf/2405.04725>

**10 Mar** ~15 UT – large SW filament eruption, slow CME

### Spectral Properties and the Influence of Coronal Mass Ejections in 3He-rich Solar Energetic Particle Events

Samuel T. **Hart**<sup>1,2</sup>, M. A. Dayeh<sup>1,2</sup>, R. Bučik<sup>2</sup>, G. M. Mason<sup>3</sup>, M. I. Desai<sup>1,2</sup>, R. W. Ebert<sup>1,2</sup>, G. C. Ho<sup>2</sup>, and A. A. Shmies<sup>1,2</sup>  
2024 ApJ 974 220  
<https://iopscience.iop.org/article/10.3847/1538-4357/ad6b99/pdf>

### Longitudinal Extent of 3He-rich Solar Energetic Particle Events Near 1 au

George C. **Ho**<sup>1</sup>, Glenn M. Mason<sup>2</sup>, Robert C. Allen<sup>1</sup>, Athanasios Kouloumvakos<sup>2</sup>, Robert F. Wimmer-Schweingruber<sup>3</sup>, and Javier Rodríguez-Pacheco<sup>4</sup>  
2024 ApJ 974 68  
<https://iopscience.iop.org/article/10.3847/1538-4357/ad67ce/pdf>

**11 Mar** ~09 UT – one more large SSW filament eruption, 304 Å, slow CME  
<https://www.spaceweather.com/images2023/11mar23/darkprom.gif>

**12 Mar** ~17 UT – SE filament eruption

**13 Mar** 'EXTREMELY RARE' FAR SIDE HALO CME:  $V > 3000$  km/s, длительные протоны SEP J10~11-22 pfu; аналог 23 Jul 2012

<https://www.spaceweather.com/images2023/13mar23/halocme.gif>  
<https://www.spaceweather.com/images2023/15mar23/radstorm.jpg>  
[https://www.spaceweather.com/images2023/13mar23/sample\\_streaks\\_and\\_specks.jpg](https://www.spaceweather.com/images2023/13mar23/sample_streaks_and_specks.jpg)  
<https://www.swpc.noaa.gov/news/s1-minor-solar-radiation-storm-event-began-13-march-2023>

~13 UT – central N circular filament eruption

### Direct Measurements of Synchrotron-emitting Electrons at Near-Sun Shocks

I. C. **Jebaraj**<sup>1</sup>, O. V. Agapitov<sup>2,3</sup>, M. Gedalin<sup>4</sup>, L. Vuorinen<sup>1,5</sup>, M. Miceli<sup>6</sup>, C. M. S. Cohen<sup>7</sup>, A. Voshchepynets<sup>2,8</sup>, A. Kouloumvakos<sup>9</sup>, N. Dresing<sup>1</sup>, A. Marmyleva<sup>10</sup>Show full author list  
2024 ApJL 976 L7  
<https://iopscience.iop.org/article/10.3847/2041-8213/ad8eb8/pdf>

### Acceleration of Electrons and Ions by an "Almost" Astrophysical Shock in the Heliosphere

Immanuel Christopher **Jebaraj**<sup>1</sup>, Oleksiy Agapitov<sup>2</sup>, Vladimir Krasnoselskikh<sup>2,3</sup>, Laura Vuorinen<sup>1</sup>, Michael Gedalin<sup>4</sup>, Kyung-Eun Choi<sup>2</sup>, Erika Palmerio<sup>5</sup>, Nicolas Wijsen<sup>6</sup>, Nina Dresing<sup>1</sup>, Christina Cohen<sup>7</sup>Show full author list  
2024 ApJL 968 L8  
<https://iopscience.iop.org/article/10.3847/2041-8213/ad4daa/pdf>  
<https://arxiv.org/pdf/2405.07074>

**13-23 Mar**

### ПОТОКИ СОЛНЕЧНЫХ ЭНЕРГИЧНЫХ ПРОТОНОВ В ОКОЛОЗЕМНОМ ПРОСТРАНСТВЕ 13-23 МАРТА 2023 ГОДА

ВЛАСОВА Н.А.<sup>1</sup>, БАЗИЛЕВСКАЯ Г.А.<sup>2</sup>, ГИНЗБУРГ Е.А.<sup>3</sup>, ДАЙБОГ Е.И.<sup>1</sup>, КАЛЕГАЕВ В.В.<sup>1,4</sup>, КАПОРЦЕВА К.Б.<sup>1,4</sup>, ЛОГАЧЕВ Ю.И.<sup>1</sup>, МЯГКОВА И.Н.<sup>1</sup>

КОСМИЧЕСКИЕ ИССЛЕДОВАНИЯ Том: 62 Номер: 2 Год: 2024 Страницы: 177-187

**15 Mar** two short-term G2-class GEOSTORMs  $K_p=5,5$   $Dst=-53$   $B_z \sim -12$  due to CME influences



**15-16 Mar**

**On the Most Interesting Solar-Wind and Cosmic-Ray Events in February–April 2023.**

Belov, S.M., Shlyk, N.S., Abunina, M.A. et al.

Sol Phys 299, 164 (2024).

<https://doi.org/10.1007/s11207-024-02406-8>

**17 Mar** ~05 UT – large SW filament eruption, **304 A**,

<https://www.spaceweather.com/images2023/17mar23/darkfilament.gif>

~15 UT – central/NW filament eruption,

**18 Mar** a colossal "solar tornado" dance near the sun's North Pole [it spun out](#) , [CME](#)

[https://spaceweathergallery2.com/indiv\\_upload.php?upload\\_id=194126](https://spaceweathergallery2.com/indiv_upload.php?upload_id=194126)

**[Russell-McPherron effect](#)**

**Radial Variations in Solar Type III Radio Bursts**

Vratislav [Krupar](#)<sup>1,2</sup>, Oksana Kruparova<sup>1,2</sup>, Adam Szabo<sup>2</sup>, Lynn B. Wilson III<sup>2</sup>, Frantisek Nemec<sup>3</sup>, Ondrej Santolik<sup>3,4</sup>, Marc Pulupa<sup>5</sup>, Karine Issautier<sup>6</sup>, Stuart D. Bale<sup>5,7</sup>, and Milan Maksimovic<sup>6</sup>

2024 ApJL 967 L32

<https://iopscience.iop.org/article/10.3847/2041-8213/ad4be7/pdf>

**19-20 Mar** **large-scale trans-equatorial eruption on 19-20 Mar, CMEs** see

D:\Chertok\_new\Cycles 23-25\_Events\Cycle\_25\2023\230320

**Analysis of solar eruptions deflecting in the low corona: influence of the magnetic environment**

[A. Sahade](#), [A. Vourlidas](#), [C. Mac Cormack](#)

ApJ 2024

<https://arxiv.org/pdf/2411.11599>

**20 Mar** Several filament eruptions, LDE flares and CMEs

**Analysis of solar eruptions deflecting in the low corona: influence of the magnetic environment**

[A. Sahade](#), [A. Vourlidas](#), [C. Mac Cormack](#)

ApJ 2024

<https://arxiv.org/pdf/2411.11599>

**Unexpected major geomagnetic storm caused by faint eruption of a solar trans-equatorial flux rope**

**Teng**, WL (Teng, Weilin) ; **Su**, YN (Su, Yingna) ; **Ji**, HS (Ji, Haisheng) ; **Zhang**, QM (Zhang, Qingmin)

Nature Communication Volume 15 Issue 1 Article Number 9198 2024

DOI 10.1038/s41467-024-53538-1

**Asymmetric Hard X-ray Radiation of Two Ribbons in a Thermal-Dominated C-Class Flare**

[Guanglu Shi](#), [Li Feng](#), [Jun Chen](#), [Beili Ying](#), [Shuting Li](#), [Qiao Li](#), [Hui Li](#), [Ying Li](#), [Kaifan Ji](#), [Yu Huang](#), [Weiqun Gan](#), the [LST team](#)

Solar Phys. 2024

<https://arxiv.org/pdf/2407.13099>

**21 Mar**

## **A New Mechanism For Generating Type-III Radiation From The Sun**

[Forrest Mozer](#), [Oleksiy Agapitos](#), [Stuart Bale](#), [Keith Goetz](#), [Vladimir Krasnoselskikh](#), [Marc Pulupa](#), [Konrad Sauer](#), [Andrii Voshchepinets](#)

2024

<https://arxiv.org/ftp/arxiv/papers/2403/2403.05984.pdf>

## **23-24 Mar Severe G3-G4 GEOSTORM Kp=7,5 Dst=- 184 Bz~-16**

<https://www.spaceweather.com/images2023/24mar23/acrackopened.jpg> , **due to large-scale trans-equatorial eruption on 19-20 Mar, CMEs** see **D:\Chertok\_new\Cycles 23-**

**25\_Events\Cycle\_25\2023\230320**

<https://www.nesdis.noaa.gov/news/time-lapse-of-solar-cycle-25-displays-increasing-activity-the-sun>

<https://www.swpc.noaa.gov/news/g4-severe-geomagnetic-storm-alert-24-march-utc-day>

## **Variation Spectra and Anisotropy of Cosmic Rays during Forbush Effects in March 2023**

**Kovalev**, II ; Kravtsova, MV ; Olemskoy, SV ; Sdobnov, VE

COSMIC RESEARCH Volume 62 Issue 6 Page 533-539 2024

DOI 10.1134/S001095252460032X

## **Variation Spectra and Anisotropy of Cosmic Rays during Forbush Effects in March 2023**

**Kovalev**, II ; Kravtsova, MV ; Olemskoy, SV ; Sdobnov, VE

COSMIC RESEARCH Volume 62 Issue 6 Page 533-539 2024

DOI 10.1134/S001095252460032X

## **On the Most Interesting Solar-Wind and Cosmic-Ray Events in February–April 2023.**

**Belov**, S.M., Shlyk, N.S., Abunina, M.A. et al.

Sol Phys 299, 164 (2024).

<https://doi.org/10.1007/s11207-024-02406-8>

## **Unexpected major geomagnetic storm caused by faint eruption of a solar trans-equatorial flux rope**

**Teng**, WL (Teng, Weilin) ; Su, YN (Su, Yingna) ; Ji, HS (Ji, Haisheng) ; Zhang, QM (Zhang, Qingmin)

Nature Communication Volume 15 Issue 1 Article Number 9198 2024

DOI 10.1038/s41467-024-53538-1

## **Origin of the type III radiation observed near the Sun**

F. S. **Mozer**<sup>1,2</sup>, O. Agapitov<sup>1</sup>, S. D. Bale<sup>1,2</sup>, K. Goetz<sup>3</sup>, V. Krasnoselskikh<sup>4</sup>, M. Pulupa<sup>1</sup>, K. Sauer<sup>5</sup> and A. Voshchepynets<sup>6</sup>

A&A, 690, L6 (2024)

<https://www.aanda.org/articles/aa/pdf/2024/10/aa51134-24.pdf>

## **28 Mar**

### **Analysis of solar eruptions deflecting in the low corona: influence of the magnetic environment**

[A. Sahade](#), [A. Vourlidas](#), [C. Mac Cormack](#)

ApJ 2024

<https://arxiv.org/pdf/2411.11599>

## **29 Mar 02:30 - SW AR3256 X1.2 impulsive flare , S3~140**

[https://www.spaceweather.com/images2023/29mar23/x1p2\\_teal\\_anim.gif](https://www.spaceweather.com/images2023/29mar23/x1p2_teal_anim.gif)

~11UT - SE filament eruption 304 A

## **30 Mar**

### **Energy estimation of small-scale jets from the quiet-Sun region★**

Fanpeng **Shi** (史帆鹏)<sup>1,2</sup>, Dong Li (李东)<sup>1,2</sup>, Zongjun Ning (宁宗军)<sup>1,2</sup>, Jun Xu (徐俊)<sup>1,2</sup>, Yuxiang Song (宋宇祥)<sup>1,2</sup> and Yuzhi Yang (杨宇知)<sup>1,2</sup>  
A&A, 686, A279 (2024)  
<https://www.aanda.org/articles/aa/pdf/2024/06/aa49377-24.pdf>

**30-31 Mar** **GEOSTORM** **Kp=4,5** **Dst=- 38** **Bz~-5** due to a [small](#) CH1138  
Several NW CMEs

**4 Apr**

**The Magnetic Field Calibration of the Full-Disk Magnetograph onboard the Advanced Space based Solar Observatory (ASO-S/FMG)**

[S. Liu](#), [J.T. Su](#), [X.Y. Bai](#), [Y.Y. Deng](#), [J. Chen](#), [Y.L. Song](#), [X.F. Wang](#), [H.Q. Xu](#), [X. Yang](#)  
2023

<https://arxiv.org/pdf/2312.00319.pdf>

**7 Apr**: A filament eruptions across a central AR 13269 at 08 UT and at ~15 UT in NW sector

**Stereoscopic observations reveal coherent morphology and evolution of solar coronal loops**

B. **Ram** (1), [L. P. Chitta](#) (1), [S. Mandal](#) (1), [H. Peter](#) (1 and 2), [F. Plaschke](#) (3)

A&A 2024

<https://arxiv.org/pdf/2411.16943>

**Investigating coronal loop morphology and dynamics from two vantage points**

Sudip **Mandal**, [Hardi Peter](#), [James A. Klimchuk](#), [Sami K. Solanki](#), [Lakshmi Pradeep Chitta](#), [Regina Aznar Cuadrado](#), [Udo Schühle](#), [Luca Teriaca](#), [David Berghmans](#), [Cis Verbeeck](#), [Frédéric Auchère](#), [Koen Stegen](#)

A&A Letter 2024

<https://arxiv.org/pdf/2401.07349.pdf>

**7-8 Apr**

**Two Intermittent Eruptions of a Minifilament Triggered by a Two-step Magnetic Reconnection Within a Fan-spine Configuration**

Liping **Yang**<sup>1,2</sup>, Zhike Xue<sup>1,3</sup>, Jincheng Wang<sup>1,3</sup>, Liheng Yang<sup>1,3</sup>, Qiaoling Li<sup>4,5</sup>, Yian Zhou<sup>1,3</sup>, Yang Peng<sup>1,2</sup>, and Xinsheng Zhang<sup>1,2</sup>

2024 ApJ 976 135

<https://iopscience.iop.org/article/10.3847/1538-4357/ad84f9/pdf>

**8 Apr**

**Heavy-ion Acceleration in 3He-rich Solar Energetic Particle Events: New Insights from Solar Orbiter**

G. M. **Mason**, I. Roth, N. V. Nitta, R. Bučik, D. Lario, G. C. Ho, R. C. Allen, A. Kouloumvakos, R. F. Wimmer-Schweingruber, and J. Rodriguez-Pacheco

2023 ApJ 957 112

<https://iopscience.iop.org/article/10.3847/1538-4357/acf31b/pdf>

**9 Apr**: ~18 UT - SW filament eruption, partial halo CME

**10 Apr**: ~06 UT - A filament eruption in the NE quadrant

**15 Apr**: ~10 and 22 UT – Two large filament eruptions in the NW quadrant

**15-17 Apr**

**Coronal hole picoflare jets are the progenitors of both the fast and the Alfvénic slow solar wind**

[L. P. Chitta](#), [Z. Huang](#), [R. D'Amicis](#), [D. Calchetti](#), [A. N. Zhukov](#), [E. Kraaikamp](#), [C. Verbeeck](#), [R. Aznar Cuadrado](#), [J. Hirzberger](#), [D. Berghmans](#), [T. S. Horbury](#), [S. K. Solanki](#), [C. J. Owen](#), [L. Harra](#), [H. Peter](#), [U. Schühle](#), [L. Teriaca](#), [P. Louarn](#), [S. Livi](#), [A. S. Giunta](#), [D. M. Hassler](#), [Y.-M. Wang](#)

A&A 2024

<https://arxiv.org/pdf/2411.16513>

**16 Apr** gradual NE filament eruption

**17 Apr**

**Correction for the Weakening Magnetic Field within the Sunspot Umbra Observed by ASO-S/FMG**

[Haiqing Xu](#), [Jiangtao Su](#), [Suo Liu](#), [Yuanyong Deng](#), [Xianyong Bai](#), [Jie Chen](#), [Xiaofan Wang](#), [Xiao Yang](#), [Yongliang Song](#)

Solar Phys. 2024

<https://arxiv.org/pdf/2405.18699>

**20 Apr** ~18 UT - A solar **tornado** around the north pole, [CME](#)

[https://www.spaceweather.com/images2023/20apr23/tonado\\_anim.gif](https://www.spaceweather.com/images2023/20apr23/tonado_anim.gif)

**2023 Total Solar Eclipse in Australia**

**The Coronal Flattening Index at the 20 April 2023 Total Solar Eclipse and the Prediction of Solar Cycle 25.**

[Pangestu](#), [A.D.](#), [Yusuf](#), [A.A.](#), [Prastyo](#), [H.A.](#) et al.

Sol Phys 299, 58 (2024).

<https://doi.org/10.1007/s11207-024-02307-w>

**Cool matter distribution in inner solar corona from 2023 total solar eclipse observation**

[Z.Q. Qu](#), [H. Su](#), [Y. Liang](#), [Z. Xu](#), [R.Y. Zhou](#)

2024

<https://arxiv.org/pdf/2404.18563>

**A Chromatic Treatment of Linear Polarization in the Solar Corona at the 2023 Total Solar Eclipse**

[Ritesh Patel](#)<sup>1</sup>, [Daniel B. Seaton](#)<sup>1</sup>, [Amir Caspi](#)<sup>1</sup>, [Sarah A. Kovac](#)<sup>1</sup> +++

2023 Res. Notes AAS 7 241

<https://iopscience.iop.org/article/10.3847/2515-5172/ad0b0d>

**21 Apr** 18 UT - almost **central filament eruption and M1.3/2N LDE flare near AR3283 (S22W11)**, global EIT wave, S3~110, II/IV bursts, slowly rising protons J10~2, halo CME

[https://www.spaceweather.com/images2023/21apr23/filament\\_anim\\_purple.gif](https://www.spaceweather.com/images2023/21apr23/filament_anim_purple.gif)

[https://www.spaceweather.com/images2023/21apr23/halo\\_cme.gif](https://www.spaceweather.com/images2023/21apr23/halo_cme.gif)

[https://www.spaceweather.com/images2023/22apr23/SApril212023\\_SWspec\\_ASHCRAFT.png](https://www.spaceweather.com/images2023/22apr23/SApril212023_SWspec_ASHCRAFT.png)

<https://www.nesdis.noaa.gov/news/time-lapse-of-solar-cycle-25-displays-increasing-activity-the-sun>

**The Multifaceted M1.7 GOES-class Flare Event of 21 April 2023 in AR13283.**

[Elmhamdi](#), [A.](#), [Marassi](#), [A.](#), [Romano](#), [P.](#) et al.

Sol Phys 299, 109 (2024).

<https://doi.org/10.1007/s11207-024-02355-2>

**SOLOHI'S VIEWPOINT ADVANTAGE: TRACKING THE FIRST MAJOR GEO-EFFECTIVE CORONAL MASS EJECTION OF THE CURRENT SOLAR CYCLE**

E. Paouris<sup>1,2</sup>, A. Vourlidis<sup>2</sup>, P. Hess<sup>3</sup>, M. Georgoulis<sup>2</sup>, G. Stenborg<sup>2</sup>

Solar Orbiter Nugget #30 May 2024

<https://www.cosmos.esa.int/web/solar-orbiter/-/science-nugget-tracking-the-first-major-geo-effective-coronal-mass-ejection-of-the-current-solar-cycle>

### **Broad and Bi-directional narrow quasi-periodic fast-propagating wave trains associated with a filament-driven halo CME on 2023 April 21**

[Xinping Zhou](#), [Yuandeng Shen](#), [Yihua Yan](#), [Ke Yu](#), [Zhining Qu](#), [Ahmed Ahmed Ibrahim](#), [Zehao Tang](#), [Chengrui Zhou](#), [Song Tan](#), [Ye Qiu](#), [Hongfei Liang](#)

ApJ 2024

<https://arxiv.org/pdf/2404.18391>

### **Filament eruption from active region 13283 leading to fast halo-CME and intense geomagnetic storm on 23 April 2023**

[P. Vemareddy](#)

ApJ 961 199 2024

<https://arxiv.org/pdf/2312.08790.pdf>

<https://iopscience.iop.org/article/10.3847/1538-4357/ad1662/pdf>

**22 Apr**

### **Solar flares in the Solar Orbiter Era: Short exposure EUV/FSI observations of STIX flares**

[Hannah Collier](#), [Laura A. Hayes](#), [Stefan Purkhart](#), [Säm Krucker](#), [Daniel F. Ryan](#), [Vanessa Polito](#), [Astrid M. Veronig](#), [Louise K. Harra](#), [David Berghmans](#), [Emil Kraaikamp](#), [Marie Dominique](#), [Laurent R. Dolla](#), [Cis Verbeek](#)

A&A 2024

<https://arxiv.org/pdf/2411.09319>

**23-24 Apr SEVERE GEOMAGNETIC G4 STORM  $K_p=8$   $Dst=-207$   $B_z\sim-32$   
Energetic Storm Particles (ESP) J10~26**

### **Global Observations of Geomagnetically Induced Currents Caused by an Extremely Intense Density Pulse During a Coronal Mass Ejection**

[Terry Z. Liu](#), [Xueling Shi](#), [Michael D. Hartinger](#), [Vassilis Angelopoulos](#), [Craig J. Rodger](#), [Ari Viljanen](#), [Yi Qi](#), [Chen Shi](#), [Hannah Parry](#), [Ian Mann](#), [Darcy Cordell](#) ... [See all authors](#)

Space Weather [Volume22, Issue10](#) October 2024 e2024SW003993

<https://doi.org/10.1029/2024SW003993>

<https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2024SW003993>

### **On the Most Interesting Solar-Wind and Cosmic-Ray Events in February–April 2023.**

Belov, S.M., Shlyk, N.S., Abunina, M.A. et al.

Sol Phys 299, 164 (2024).

<https://doi.org/10.1007/s11207-024-02406-8>

### **Study of Evolution and Geo-effectiveness of Coronal Mass Ejection–Coronal Mass Ejection Interactions Using Magnetohydrodynamic Simulations with SWASTi Framework**

Prateek **Mayank**<sup>1</sup>, Stefan Lotz<sup>2</sup>, Bhargav Vaidya<sup>1,3</sup>, Wageesh Mishra<sup>4</sup>, and D. Chakrabarty<sup>5</sup>

2024 ApJ 976 126

<https://iopscience.iop.org/article/10.3847/1538-4357/ad8084/pdf>

### **The April 2023 SYM-H = -233 nT Geomagnetic Storm: A Classical Event**

Rajkumar **Hajra**, [Bruce Tsatnam Tsurutani](#), [Quanming Lu](#), [Richard B. Horne](#), [Gurbax Singh Lakhina](#), [Xu Yang](#), [Pierre Henri](#), [Aimin Du](#), [Xingliang Gao](#), [Rongsheng Wang](#), [San Lu](#)

JGR 2024

<https://arxiv.org/pdf/2409.08118>

### **The Multifaceted M1.7 GOES-class Flare Event of 21 April 2023 in AR13283.**

**Elmhamdi**, A., Marassi, A., Romano, P. et al.

Sol Phys 299, 109 (2024).

<https://doi.org/10.1007/s11207-024-02355-2>

### **Distorted Magnetic Flux Ropes within Interplanetary Coronal Mass Ejections**

**Andreas J. Weiss**, **Teresa Nieves-Chinchilla**, **Christian Möstl**

ApJ 2024

<https://arxiv.org/pdf/2406.13022>

### **SOLOHI'S VIEWPOINT ADVANTAGE: TRACKING THE FIRST MAJOR GEO-EFFECTIVE CORONAL MASS EJECTION OF THE CURRENT SOLAR CYCLE**

E. **Paouris**<sup>1,2</sup>, A. Vourlidas<sup>2</sup>, P. Hess<sup>3</sup>, M. Georgoulis<sup>2</sup>, G. Stenborg<sup>2</sup>

Solar Orbiter Nugget #30 May 2024

<https://www.cosmos.esa.int/web/solar-orbiter/-/science-nugget-tracking-the-first-major-geo-effective-coronal-mass-ejection-of-the-current-solar-cycle>

### **ICME pancaking: a cause of two-step severe storm (Dst~−187 nT) of 25th solar cycle observed on 23 April 2023**

Kalpesh **Ghag**, **Anil Raghav**, **Ankush Bhaskar**, **Shirish Soni**, **Bhagyashri Sathe**, **Zubair Shaikh**, **Omkar Dhamane**, **Prathmesh Tari**

JGR: Space Weather 2023

<https://arxiv.org/pdf/2305.05381.pdf>

**24 Apr** 13 UT – SW filament [explosion](#) , [CME](#)

### **Interaction of the Prominence Plasma within the Magnetic Cloud of an Interplanetary Coronal Mass Ejection with the Earth's Bow Shock**

Hadi **Madanian**<sup>1,2</sup>, Li-Jen Chen<sup>1</sup>, Jonathan Ng<sup>1,3</sup>, Michael J. Starkey<sup>4</sup>, Stephen A.

Fuselier<sup>4</sup>, Naoki Bessho<sup>1,3</sup>, Daniel J. Gershman<sup>1</sup>, and Terry Z. Liu<sup>5</sup>

2024 ApJ 976 219

<https://iopscience.iop.org/article/10.3847/1538-4357/ad8579/pdf>

### **Earth's Alfvén wings driven by the April 2023 Coronal Mass Ejection**

Li-Jen **Chen**, **Daniel Gershman**, **Brandon Burkholder**, **Yuxi Chen**, +++

2024

<https://arxiv.org/ftp/arxiv/papers/2402/2402.08091.pdf>

**25 Apr**

### **Observations of coronal holes with the Siberian Radioheliograph**

**Altyntsev, Alexander** , **Globa, Mariia Meshalkina, Nataliya** ; **Sych, Robert**

Solar-Terrestrial Physics, vol. 10, issue 3, pp. 3-10, 2024

<https://naukaru.ru/en/storage/download/169702>

**26 Apr** ~09 UT – NE cannibal CME

<https://www.spaceweather.com/images2023/26apr23/cannibal.gif>

**27 Apr** ~03 UT – NE eruption

**1 May** 13:09 – **Impulsive (spike) M7 flare with a compact soft X-ray source** in AR3288 (S23W44), S15~230, without CME

**3 May** 09:13–13:51 – **a series of IMPULSIVE (SPIKE) M-class (up to M7.2) flares** in SW AR 3293

## Photospheric Pore Rotation Associated with a C-class Flare from Spectropolarimetric Observations with DKIST

[Rahul Yadav](#), [Maria D. Kazachenko](#), [Andrey N. Afanasyev](#), [Gianna Cauzzi](#), [Kevin Reardon](#)

ApJL 2024

<https://arxiv.org/pdf/2408.16956>

**4 May** 08:44 – M3.9 LDE flare in reversed-polarity sunspot AR3296 (N17E43), [https://www.spaceweather.com/images2023/04may23/m3\\_tea.gif](https://www.spaceweather.com/images2023/04may23/m3_tea.gif) strong dm-burst S5~700, II/2 type, [CME at the 9 o'clock position](#), [Take a look](#). On background of the farside [halo CME](#)

**5 May** [The sun is crackling](#) with M-class NE flares and [many CMEs](#)

**6 May** **G2 GEOMAGNETIC STORM**  $K_p=6$   $Dst=-75$   $B_z\sim-16$

**7-8 May** 22:34 - EARTH-DIRECTED M1.5 **LDE FLARE** in the central reversed-polarity AR3296 AND full halo CME [https://www.spaceweather.com/images2023/07may23/halo\\_cme.gif](https://www.spaceweather.com/images2023/07may23/halo_cme.gif) ; Protons J10~2→16→36

## Development of a 90–600 MHz Meter-wave Solar Radio Spectrometer

ShuWang **Chang**<sup>1,2</sup>, Bing Wang<sup>1</sup>, Guang Lu<sup>1</sup>, YuPeng Shen, +++

2024 ApJS 272 21

<https://iopscience.iop.org/article/10.3847/1538-4365/ad3de7/pdf>

**8 May**

## Development of a 90–600 MHz Meter-wave Solar Radio Spectrometer

ShuWang **Chang**<sup>1,2</sup>, Bing Wang<sup>1</sup>, Guang Lu<sup>1</sup>, YuPeng Shen, +++

2024 ApJS 272 21

<https://iopscience.iop.org/article/10.3847/1538-4365/ad3de7/pdf>

## Three-dimensional velocity fields of the solar filament eruptions detected by CHASE

[Ye Qiu](#), [Chuan Li](#), [Yang Guo](#), [Zhen Li](#), [Mingde Ding](#), [Linggao Kong](#)

ApJ 2024

<https://arxiv.org/pdf/2401.16730.pdf>

**9 May** 03:51 – **impulsive M6.5 flare** in the reversed-polarity AR3296 (N13W25), S15~2500, type II, <https://www.spaceweather.com/images2023/09may23/mflares.jpg>

AR3296 unleashed a double flare,

18:58 – M4.2/1B **LDE**, N13W31, S5~1400, type II, halo CME, Protons J10~35

20:52 – M5.0/1N, N14WW35, S9~570

[https://www.spaceweather.com/images2023/09may23/doubleflare\\_tea\\_strip\\_opt.gif](https://www.spaceweather.com/images2023/09may23/doubleflare_tea_strip_opt.gif)

[https://www.spaceweather.com/images2023/09may23/halocme\\_anim.gif](https://www.spaceweather.com/images2023/09may23/halocme_anim.gif)

## On the Instrumental Discrepancies in Lyman-alpha Observations of Solar Flares

[Harry J. Greatorex](#), [Ryan O. Milligan](#), [Ingolf E. Dammasch](#)

Solar Phys. 2024

<https://arxiv.org/pdf/2411.00736>

## A Multi-Peak Solar Flare with a High Turnover Frequency of The Gyrosynchrotron Spectra from the Loop-Top Source

[Zhao Wu](#), [Alexey Kuznetsov](#), [Sergey Anfinogentov](#), [Victor Melnikov](#), [Robert Sych](#), [Bing Wang](#), [Ruisheng Zheng](#), [Xiangliang Kong](#), [Baolin Tan](#), [Zongjun Ning](#), [Yao Chen](#)

ApJ? 2024

<https://arxiv.org/pdf/2405.03116>

**A Statistical Investigation of the Neupert Effect in Solar Flares Observed with ASO-S/HXI**  
[Dong Li](#), [Hanyang Dong](#), [Wei Chen](#), [Yang Su](#), [Yu Huang](#), [Zongjun Ning](#)  
Solar Phys. 2024  
<https://arxiv.org/pdf/2404.02653.pdf>

**10 May** 14:21 - M2.2 flare, N13W51, S9~140  
Геомагнитная возмущённость Kp~5.2 **Protons J10~40 → 84** (не от этой вспышки)

**11 May** – Two impulsive M2.2/1N and M1.8/1N flare at NW

**The magnetic origin of the mystery of rare H $\alpha$  Moreton waves**  
[Ze Zhong](#), [Yao Chen](#), [Y.W. Ni](#), [P. F. Chen](#), [Ruisheng Zheng](#), [Xiangliang Kong](#), [Chuan Li](#)  
ApJ 2024  
<https://arxiv.org/pdf/2412.19984>

**Negative-energy Waves in the Vertical Threads of a Solar Prominence**  
Jincheng [Wang](#)<sup>1,2</sup>, Dong Li<sup>3,2</sup>, Chuan Li<sup>4,5,6</sup>, Yijun Hou<sup>7,2</sup>, Zhike Xue<sup>1,2</sup>, Zhe Xu<sup>1,2</sup>, Liheng Yang<sup>1,2</sup>, and Qiaoling Li<sup>8</sup>  
2024 ApJL 965 L28  
<https://iopscience.iop.org/article/10.3847/2041-8213/ad3af8/pdf>  
<https://arxiv.org/pdf/2404.03199.pdf>

**12 May** Геомагнитная возмущённость Kp~5.2 [A CME](#) hit Earth's magnetic field at 0635 UT, [the impact](#), B~ 34 nT, but Bz>0

**13-15 May**  
**Study of Evolution and Geo-effectiveness of Coronal Mass Ejection–Coronal Mass Ejection Interactions Using Magnetohydrodynamic Simulations with SWASTi Framework**  
Prateek [Mayank](#)<sup>1</sup>, Stefan Lotz<sup>2</sup>, Bhargav Vaidya<sup>1,3</sup>, Wageesh Mishra<sup>4</sup>, and D. Chakrabarty<sup>5</sup>  
2024 ApJ 976 126  
<https://iopscience.iop.org/article/10.3847/1538-4357/ad8084/pdf>

**16 May** 16:43 - M9.6 PARTIALLY ECLIPSED SE limb flare, SE limb  
[https://www.spaceweather.com/images2023/16may23/m9p6\\_teal\\_anim.gif](https://www.spaceweather.com/images2023/16may23/m9p6_teal_anim.gif)  
~18 UT – крупный CME над W лимбом, вероятно от backside источника  
слабые J10<1 SEP протоны

**Composition variation of the May 16 2023 Solar Energetic Particle Event observed by Solar Orbiter and Parker Solar Probe**  
Z.G. [Xu](#), [C.M.S. Cohen](#), [R.A. Leske](#), [G.D. Muro](#), [A.C. Cummings](#), +++  
ApJ 2024  
<https://arxiv.org/pdf/2410.19672>

**17 May** SW filament eruption, associated with a C4 flare in AR 13309, CME  
[https://www.spaceweather.com/images2023/17may23/southernfilament\\_crop.gif](https://www.spaceweather.com/images2023/17may23/southernfilament_crop.gif)

**18-20 May** A series of M-class flares mainly from eastern AR3311  
<https://www.spaceweather.com/images2023/18may23/crackling0.jpg>  
The largest 20d, 12:35 – M8.9, N19E65, S15~140

**19-20 May** SURPRISE G1 GEOMAGNETIC STORM Kp=5.5 Dst=-60 Bz~-18

**21-22 May** G1 GEOMAGNETIC STORM Kp=6 Dst=-40 Bz~-11



<https://www.spaceweather.com/images2023/21may23/data.jpg>

**22 May** ~00 UT – halo CME

**23 May**

**Correction for the Weakening Magnetic Field within the Sunspot Umbra Observed by ASO-S/FMG**

[Haiqing Xu](#), [Jiangtao Su](#), [Suo Liu](#), [Yuanyong Deng](#), [Xianyong Bai](#), [Jie Chen](#), [Xiaofan Wang](#), [Xiao Yang](#), [Yongliang Song](#)

Solar Phys. 2024

<https://arxiv.org/pdf/2405.18699>

**31 May** 22:52 - [M4 LDE flare](#) in SE near-limb AR3323 после ряда менее интенсивных M вспышек <https://www.spaceweather.com/images2023/31may23/slowflare.gif>

**3 Jun**

**Long-period energy releases during a C2.8 flare**

[Dong Li](#), [Jianping Li](#), [Jinhua Shen](#), [Qiwu Song](#), [Haisheng Ji](#), [Zongjun Ning](#)

A&A 2024

<https://arxiv.org/pdf/2408.01179>

**4 Jun** >08 UT – large SW filament eruption [movie](#)

**7 Jun** 11:46 – M4.7 impulsive+ flare, S15E37, J9~340

**9 Jun** 17:11 – M2.5 flare in SE AR3331

[https://www.spaceweather.com/images2023/09jun23/m2p5\\_anim.gif](https://www.spaceweather.com/images2023/09jun23/m2p5_anim.gif)

**12 Jun**

**Fast Downflows Observed during a Polar Crown Filament Eruption**

[Zheng Sun](#), [Hui Tian](#), [Ting Li](#), [Rui Liu](#), [Yadan Duan](#)

ApJ 2024

<https://arxiv.org/pdf/2408.15892>

**15-16 Jun** **CIR SPARKS G2-CLASS GEOMAGNETIC STORM Kp=6 Dst=-54 Bz~-10**

A recurrent trans equatorial coronal hole (CH1153) rotated across the central meridian on June 12-15

**17 Jun** ~20 UT – NW **thin** filament eruption

**18 Jun** 13:53 - M2.5 flare ([movie](#)) in AR3335, S16E16, ERU, type II/1

**19Jun**

**A Statistical Investigation of the Neupert Effect in Solar Flares Observed with ASO-S/HXI**

[Dong Li](#), [Hanyang Dong](#), [Wei Chen](#), [Yang Su](#), [Yu Huang](#), [Zongjun Ning](#)

Solar Phys. 2024

<https://arxiv.org/pdf/2404.02653.pdf>

**20 Jun** 17:09 – **X1.1 LDE- flare** near SE limb, AR3341, S9~590, type II, [a CME](#) , [a NASA model](#) , [https://www.spaceweather.com/images2023/20jun23/xflare\\_anim.gif](https://www.spaceweather.com/images2023/20jun23/xflare_anim.gif)

**Observational signature of continuously operating drivers of decayless kink oscillation**

[Dong Li](#), [Zhentong Li](#), [Fanpeng Shi](#), [Yang Su](#), [Wei Chen](#), [Fu Yu](#), [Chuan Li](#), [Ye Qiu](#), [Yu Huang](#), [Zongjun Ning](#)

A&A 2023  
<https://arxiv.org/pdf/2311.16434.pdf>

**22 Jun**

**Mapping the Sun's coronal magnetic field using the Zeeman effect**

[Thomas A. Schad](#), [Gordon J.D. Petrie](#), [Jeffrey R. Kuhn](#), +++

Science Advances, Vol. 10, no. 37, adq1604, 2024

<https://arxiv.org/pdf/2410.21568>

**22-23 Jun** 23:40 - **ANOTHER SIGNIFICANT FLARE** in AR3341, S16E36: **M4.5**, [movie](#)  
type II/2, IV/2, CME

**24-25 Jun** - **MINOR GEOMAGNETIC STORM** **Kp=5 Dst=-31 Bz~-10**

<https://www.spaceweather.com/images2023/24jun23/thedatasuggest.jpg>

**27-28 Jun** - NE filament eruption, [a CME](#)

**2 Jul** 2314 UT- giant NW sunspot AR3354 exploded, producing a [long X1](#) flare; **no sign** of a significant CME. [https://www.spaceweather.com/images2023/02jul23/x1\\_teal\\_anim.gif](https://www.spaceweather.com/images2023/02jul23/x1_teal_anim.gif) , unusual. A 304 Å movie <https://www.spaceweather.com/images2023/02jul23/splash.gif>

**4 Jul** A **SE filament eruption** was observed beginning near 02:30 UT and was associated with [a partial halo CME](#).

**7 Jul** - **MINOR GEOMAGNETIC STORM** **Kp=4 Dst=-26 Bz~-8**

A huge sunspot (AR3363) just emerged over the SE limb

**10 Jul** 03:55 – **M2.3/2N** short LDE flare, in AR complex S13W49, S5~32, [a halo CME](#) , type II, very small protons J10~0.6-1.2 ; 22:18 – **M1.4/1N** flare, S12W59

**GIANT SUNSPOT** [https://spaceweathergallery2.com/indiv\\_upload.php?upload\\_id=197598](https://spaceweathergallery2.com/indiv_upload.php?upload_id=197598)

**11 Jul** A big new sunspot (AR3372) is emerging over NE limb and it is crackling with flares

[https://www.spaceweather.com/images2023/11jul23/m6\\_teal\\_anim.gif](https://www.spaceweather.com/images2023/11jul23/m6_teal_anim.gif)

[seven M-class solar flares](#)

18:08 – **M6.8** spike flare, AR3372 asymmetrical full halo [CME](#)

~18:30 – southern **eruption** near/in AR3363 [an erupting magnetic filament](#)

22:15 – **M5.8** flare, AR3372, N24E83

**11-12 Jul** New NE AR3372 produced many of M-class flares: [graph](#)

<https://www.spaceweather.com/images2023/12jul23/flame2.jpg>

**12 Jul** 08:55 - **M6.9/1N** quasi-spike flare, AR3372, N24E77, S9~720

**14 Jul** - short-time **MINOR GEOMAGNETIC STORM** **Kp=4 Dst=-30 Bz~-11**

**A DARK ERUPTION 304 A** from the southern hemisphere

<https://www.spaceweather.com/images2023/15jul23/darkeruption2.gif>

A CME was observed after an M1 flare in AR 13363 at 09:36

**Sun-as-a-star observations of obscuration dimmings caused by filament eruptions**

Yu Xu, [Hui Tian](#), [Astrid M. Veronig](#), [Karin Dissauer](#)

ApJ 2024

<https://arxiv.org/pdf/2405.13671>

**15 Jul** 07:41 – **M2.9/2B** flare, AR3363, S23W37, S3~570

10:10 – M2.2 flare, AR3372, N11E63, S9~390, type II/2  
~07 and 17 UT: two SW CMEs

**15-16 Jul** SEP Protons J10~2→>10 pfu The source could be a C8.8 flare in AR 13363 or a large flare behind the west limb observed around 20h UT  
Several M flares, type II, CMEs

**16 Jul**

**МИКРОВОЛНОВАЯ ДИАГНОСТИКА ВСПЫШЕЧНОЙ ПЛАЗМЫ МЕТОДОМ ФИТИРОВАНИЯ ПО ДАННЫМ СИБИРСКОГО РАДИОГЕЛИОГРАФА**

СМИРНОВ Д.А.<sup>1,2</sup>, МЕЛЬНИКОВ В.Ф.<sup>2</sup>

СОЛНЕЧНО-ЗЕМНАЯ ФИЗИКА Том: 10 Номер: 3 Год: 2024 Страницы: 27-39

**Solar flares in the Solar Orbiter Era: Short exposure EUV/FSI observations of STIX flares**  
[Hannah Collier](#), [Laura A. Hayes](#), [Stefan Purkhart](#), [Säm Krucker](#), [Daniel F. Ryan](#), [Vanessa Polito](#), [Astrid M. Veronig](#), [Louise K. Harra](#), [David Berghmans](#), [Emil Kraaikamp](#), [Marie Dominique](#), [Laurent R. Dolla](#), [Cis Verbeecq](#)

A&A 2024

<https://arxiv.org/pdf/2411.09319>

**16-17 Jul** - short-time and long **G1 GEOMAGNETIC STORMS** Kp=4.5 Dst=-39 Bz~-12  
17:46 – short M4.0/2B flare, AR3372, S23W58, S15~730, протоны J10~2

**ИСТОЧНИКИ СОЛНЕЧНЫХ ПРОТОНОВ В СОБЫТИЯХ 24-25 ФЕВРАЛЯ И 16-17 ИЮЛЯ 2023 ГОДА**

СТРУМИНСКИЙ А.Б.<sup>1</sup>, САДОВСКИЙ А.М.<sup>1</sup>, ГРИГОРЬЕВА И.Ю.<sup>2</sup>

КОСМИЧЕСКИЕ ИССЛЕДОВАНИЯ Том: 62 Номер: 2 Год: 2024 Страницы: 188-200

**Sources of Solar Protons in the Events of February 24-25 and July 16-17, 2023**

Struminsky, AB ; Sadovskii, AM ; Grigorieva, IY

Cosmic Research Volume 62 Issue 2 Page 133-146 2024

DOI 10.1134/S0010952523600300

**17-18 Jul** 17d23:27 – **SIGNIFICANT SW EXPLOSION**, AR3363 SoLO: X10 farside flare  
[https://www.spaceweather.com/images2023/17jul23/bigone\\_strip\\_opt.gif](https://www.spaceweather.com/images2023/17jul23/bigone_strip_opt.gif)

18d00:06 – M5.7 very long LDE in AR3363, [eruption](#), LEAR 17d,23:41 – S9~540, S5~800, S3~1500, bright asymmetrical halo [CME](#), **PROTONS J10~620 GLE?**

**Prompt emission of relativistic protons up to GeV energies from M6.4-class solar flare on July 17, 2023**

Carlos Navia, [Marcel Oliveira](#), [Andre Nepomuceno](#)

ApJ 2024

<https://arxiv.org/pdf/2401.00002.pdf>

**18 Jul** ~20 UT – NE significant eruption near AR3376, large [CME](#)

**19 Jul** 17:25 – M3.8 flare in AR3363, S9~290, type II/1  
~23 UT – NW filament eruption

**22 Jul** - short-time **G1 GEOMAGNETIC STORM** Kp=4.5 Dst=-41 Bz~-15  
03:37 – M3,1/2N, , AR3372, N21W55

15:30 and 20:30 – two significant NE filament eruptions [the liftoff](#)

**23 Jul** - A C5 flare peaked at 14:44 in AR 13376, [a faint halo CME](#)

**24 Jul** 05:43 – C8.5 LDE, AR3372, N26W80, **A backside halo CME**, **протоны J10~7,6**  
<https://www.spaceweather.com/images2023/25jul23/cometchasers.jpg>

**25 Jul** 02:03 – quasi-LDE M1.5/2N flare, AR3376, N25W49, **протоны на уровне J10~2.4**  
~22:30 - Unexpectedly, a CME [hit Earth's](#) magnetic field

**25-26 Jul** **G1 GEOMAGNETIC STORM**  $K_p=4.5$   $Dst=-59$   $B_z\sim-11$

**27 Jul** ~22UT - NE-limb M1.7 LDE, [A bright CME](#)

**28 Jul** 15:58 – M4.1 impulse from NW behind the limb [magnificent eruption](#)  
in AR3376, partial halo CME, **protons J10~5 with continuation at 29th**  
~22 UT – significant NE filament [eruption 304 A](#), [CME](#)

**29 Jul** – **continuation of protons J10~149**; continuation of activity in NE sector, [CME](#)

**31 Jul-1 Aug** Activity of central filaments, **304 A**, halo CME

**1 Aug** [a series of M-class eruptions](#) in AR3380, S12W45; NE evening eruption

**2 Aug** ~08 UT – central-W filament eruption near AR 13386 (N11W22), type II,  
S3~140, faint halo [CME](#)  
**G1 GEOMAGNETIC STORM**  $K_p=4$   $Dst=-50$   $B_z\sim-9$

**3 Aug** faint morning SE eruption

**4 Aug** ~03 UT – eruption in W sector, An asymmetrical full halo CME was observed  
after the LDE M1.9 event in AR 13386 (N11W43), S3~140

**5 Aug** Morning **strong G3? GEOMAGNETIC STORM**  $K_p=6.5$   $Dst=-94$   $B_z\sim-21$  caused  
by [a CME](#) on 2 Aug

07:18 – M1.6/1N LDE AR3386, N10W63, type II/2, [the first CME](#), **protons J10~16-18**  
22:21 – X1.6 LDE AR3386, type II/1, S5~3000, [the second CME](#), **proton small  
enhancement**, [https://www.spaceweather.com/images2023/05aug23/x1p6\\_teal\\_anim2.gif](https://www.spaceweather.com/images2023/05aug23/x1p6_teal_anim2.gif)  
[A new NOAA model](#) of 'cannibal CME'

### On the Possible Mechanisms of the SEP Event and Electron Enhancement over the SEP Decay Phase on 2023 August 5

Kazi A. **Firoz**, Y. P. Li, and W. Q. Gan

2024 ApJ 977 248

<https://iopscience.iop.org/article/10.3847/1538-4357/ad90b1/pdf>

### Sun-as-a-star Analysis of the X1.6 Flare on 2023 August 5: Dynamics of Post-flare Loops in Spatially Integrated Observational Data

[Takato Otsu](#), [Ayumi Asai](#), [Kai Ikuta](#), [Kazunari Shibata](#)

ApJL 2024

<https://arxiv.org/pdf/2409.07630>

**6 Aug** ~04 UT – SE filament eruption  
**18:40 – M5.5/SN flare AR3386, N07W86, CME**

**7 Aug** 04:41 – M2.4 impulsive flare in behind NW limb AR3386  
**20:45 – X1.5 LDE in** departing sunspot AR3386, S9~3800, type II/2, magnificent [CME](#)  
behind W limb, [https://www.spaceweather.com/images2023/07aug23/x1\\_teal.gif](https://www.spaceweather.com/images2023/07aug23/x1_teal.gif)

**The White-light Emissions in Two X-class Flares Observed by ASO-S and CHASE**  
[Ying Li](#), [Zhichen Jing](#), [De-Chao Song](#), [Qiao Li](#), [Jun Tian](#), [Xiaofeng Liu](#), [Ya Wang](#), [M. D. Ding](#), [Andrea Francesco Battaglia](#), [Li Feng](#), [Hui Li](#), [Weiqun Gan](#)  
ApJL 2024  
<https://arxiv.org/pdf/2402.07374.pdf>

**7-8 Aug** protons J10~25–45 by [a recent series](#) of X- and M-class flares

**8 Aug** 09:31 - M3.6 short flare in AR3387, S21E09, CME

**17 Aug** ~12 UT – W-limb (filament) local eruption, C5 flare, narrowCME  
[https://www.spaceweather.com/images2023/17aug23/c5\\_red\\_anim.gif](https://www.spaceweather.com/images2023/17aug23/c5_red_anim.gif)

**23 Aug** - morning SW filament eruption [movie](#)  
- evening E filament eruption

**26 Aug** ~23 UT - M1.1 LDE behind E limb [a long duration flare](#) , [a bright CME](#)  
<https://www.spaceweather.com/images2023/26aug23/mysteryflare.gif>

**30 Aug** ~20 UT – central filament eruption ([movie](#)), partial halo [CME](#)

**1 Sep** 03:51 - very LDE western M1.2 flare ([movie](#)), AR3413, N09W62, S3~190, type II,  
A fast and wide asymmetrical partial halo [CME](#), **Protons J10~26**

**2 Sep** 07:12 – M3.3 LDE flare, AR3413, N10W82, S5~280, CME  
**G1-2 GEOMAGNETIC STORM Kp=5 Dst=-89 Bz~-8**  
evening NW filament eruption

**3 Sep** 08:36 – C5+M6+C5 W-limb flares, AR3413, large double CME

**5 Sep** Two-Three M-class flares from central AR3421  
Two spectacular CMEs billowed away from the farside [movie](#)

**7 Sep** ~19 UT – NW filament eruption [a dramatic explosion](#) near sunspot AR3425,  
(N22E56), M2.1/1B flare, S5~110, type II/2, overlapping CME

**8 Sep** >12 UT - [farside halo CME](#) , [NASA model](#)

**11 Sep** 01:28 – DRAMATIC NE ERUPTION in AR3429 (N08E62), 304 A, surge , M1.3 flare  
CME, <https://www.spaceweather.com/images2023/11sep23/eruption.gif>

**A type II radio burst associated with solar filament–filament interaction**

Liang [Zhang](#)<sup>1,2\*</sup>, Ruisheng [Zheng](#)<sup>1,2</sup> and Yao [Chen](#)<sup>1</sup>

A&A, 691, A4 (2024)

<https://www.aanda.org/articles/aa/pdf/2024/11/aa49523-24.pdf>

**11-12 Sep** Two farside halo CMEs (examples: [#1](#), [#2](#))

**12 Sep** **G1-2 GEOMAGNETIC STORM**  $K_p=5.5$   $Dst=-79$   $B_z\sim-19$   
**and a number of subsequent weaker storms until Sep 18**

It is probably one of many CMEs that left the sun on Sept. 8th.  
<https://www.spaceweather.com/images2023/08sep23/manycmes.gif>.  
M1.9 and M2.5 flares in a central AR3429

**14 Sep** ~07 UT - **filament** connecting western AR3423 and AR3425 [erupted](#), M1.2 LDE  
flare, halo CME ([movie](#)), weak protons  
19:31 and 21:26 – M1.9 and M2.5 **spike flares** in a central AR3429, N12E08

**15 Sep** M-class flares in a central AR3429 and filament eruption nearby  
<https://www.spaceweather.com/images2023/15sep23/crackling.gif>

**16 Sep** 00:50 – M2.9/1N, 05:38 – M3.3/1B flares in AR3429, N11W10  
~07 UT – **huge central filament eruption around AR3429** [movie](#), **304 A**,  
**halo CME** <https://www.spaceweather.com/images2023/16sep23/halocme.gif>

**18 Sep** **Protons J10~2**  
13:50 - [The sharp ICME impact](#) ,  $B\sim 20$ ,  $B_z>0$

**19 Sep** **G2 GEOMAGNETIC STORM**  $K_p=6.5$   $Dst=-82$   $B_z\sim-17$   
20:14 - M4 spike flare in AR3435 (N07E50)

**19-21 Sep**

**The magnetic origin of the mystery of rare H $\alpha$  Moreton waves**

[Ze Zhong](#), [Yao Chen](#), [Y.W. Ni](#), [P. F. Chen](#), [Ruisheng Zheng](#), [Xiangliang Kong](#), [Chuan Li](#)  
ApJ 2024  
<https://arxiv.org/pdf/2412.19984>

**20 Sep** 14:19 – M8.2 spike flare in AR3435  
[https://www.spaceweather.com/images2023/20sep23/m8\\_teal.gif](https://www.spaceweather.com/images2023/20sep23/m8_teal.gif)

**21 Sep** 12:54 – M8.7 spike flare in AR3435 (N09E19), A partial halo CME  
<https://www.spaceweather.com/images2023/21sep23/m9.jpg>

**22 Sep** 02:24 – M1.2/SF LDE flare in AR3435  
17:15 –M1.5 AR3443. N29W40 [a series of M-class solar flares](#) and eruptions,  
**multiple CMEs** The first one was a partial halo CME following a filament eruption to the  
northeast of AR 13435 triggering an M1 flare in that region. Another filament eruption occurred across the central  
meridian in the northern hemisphere (to the north of AR 13438) just hours later

**24 Sep** 03:24 – M4.4/1N flare, AR3445, S12E22 ; >11UT- NW halo CME  
<https://www.spaceweather.com/images2023/24sep23/m4.gif> **Protons J10~2.3;**

**Failure of a solar filament eruption caused by magnetic reconnection with overlying coronal loops**

[Leping Li](#), [Hongqiang Song](#), [Yijun Hou](#), [Guiping Zhou](#), [Baolin Tan](#), [Kaifan Ji](#), [Yongyuan Xiang](#), [Zhenyong Hou](#), [Yang Guo](#), [Ye Qiu](#), [Yingna Su](#), [Haisheng Ji](#), [Qingmin Zhang](#), [Yudi Ou](#)  
ApJ 2024

<https://arxiv.org/pdf/2412.01126>

**25 Sep** short-term **G1-2 GEOMAGNETIC STORM**  $K_p=5.5$   $Dst=-66$   $B_z\sim-20$ ,  
CME from 22 Sep arrived

### **Magnetic Reconnection between a Solar Jet and a Filament Channel**

[Garima Karki](#), [Brigitte Schmieder](#), [Pooja Devi](#), [Ramesh Chandra](#), [Nicolas Labrosse](#), [Reetika Joshi](#), [Bernard Gelly](#)

2024

<https://arxiv.org/pdf/2412.09206>

**26 Sep** Another **G1-2 GEOMAGNETIC STORM**  $K_p=5.5$   $Dst=-55$   $B_z\sim-12$   
the effects of the Sept. 24th CME impact

**28 Sep** 09:07 – M1.2, AR3450, S18E65, S9~230

**29 Sep** short-term **G1 GEOMAGNETIC STORM**  $K_p=4$   $Dst=-42$   $B_z\sim-8$ ,

### **Three Forbushes in September**

<https://www.spaceweather.com/images2023/03oct23/3impacts.jpg>

**1 Oct** 01:32 – M2.5 flare, eastern AR 3451

<https://www.spaceweather.com/images2023/01oct23/crackle.gif>

**2 Oct** 12:46 – M1.9/1N flare, AR3455, N20E65, a wide partial halo CME

**3 Oct**

### **Determining the acceleration regions of in situ electrons using remote radio and X-ray observations**

[D. E. Morosan](#), [N. Dresing](#), [C. Palmroos](#), [J. Gieseler](#), [I. C. Jebaraj](#), [A. Warmuth](#), [A. Fedeli](#), [S. Normo](#), [J. Pomoell](#), [E. K. J. Kilpua](#), [P. Zucca](#), [B. Dabrowski](#), [A. Krankowski](#), [G. Mann](#), [C. Vocks](#), [R. Vainio](#)

A&A 2024

<https://arxiv.org/pdf/2412.06477>

**10 Oct** 12:17 – M2.3 flare, AR3452, N09W69

**16 Oct** ~10:30 – eastern filament [eruption](#) near AR3467, C7,5 LDE flare, partial halo CME

### **New Publicly Available DKIST Data Taken Oct 16, 2023, in Coordination with Solar Orbiter**

You may access all data via the portal directly at [proposal PID\\_2\\_114 data](#).

[https://dkist.data.nso.edu/dashboard?proposalId=pid\\_2\\_114](https://dkist.data.nso.edu/dashboard?proposalId=pid_2_114)

**17 Oct** A partial halo CME was observed after a C flare in AR 13463 early in the day

**18-19 Oct** Плавная небольшая буря  $Dst\sim-31$

**19-20 Oct**

### **Coronal kink oscillations and photospheric driving: combining Solo/EUI and SST/CRISP high-resolution observations**

Nicolas [Poirier](#) (1 and 2), [Sanja Danilovic](#) (3), [Petra Kohutova](#) (1 and 2), [Carlos J. Díaz Baso](#) (1 and 2), [Luc Rouppe van der Voort](#) (1 and 2), [Daniele Calchetti](#) (4), [Jonas Sinjan](#) (4)

A&A 2024

<https://arxiv.org/pdf/2412.14805>

**21 Oct** Буря  $Dst \sim -82$ ,  $K_p=5$   $B_z \sim -9$  likely cause by the arrival of either of the October 16 and 17 CMEs

~00 UT - NW-central eruption

**22-23 Oct** Вечер 22-ого и Утро 23-его: два крупных CMEs. Backside?

**26 Oct** ~23 UT – NE limb filament eruption, M1.4 LDE, type II, [a fast-moving CME](https://www.spaceweather.com/images2023/26oct23/red_mflare.gif)  
[https://www.spaceweather.com/images2023/26oct23/red\\_mflare.gif](https://www.spaceweather.com/images2023/26oct23/red_mflare.gif)

**26-27 Oct** - **G1 GEOMAGNETIC STORM**  $K_p=4.5$   $Dst=-41$   $B_z \sim -12$ , CH1181

**27 Oct** morning CME from night filament eruption on 26th  
<https://www.spaceweather.com/images2023/26oct23/partialhalocme.gif>

**28 Oct** **G1 GEOMAGNETIC STORM**  $K_p=4.2$   $Dst=-48$   $B_z \sim -8$

**29 Oct** **G1 GEOMAGNETIC STORM**  $K_p=4.5$   $Dst=-49$   $B_z \sim -7$  in response to the arrival of CIR

**31 Oct** ~21 UT – large SE filament eruption, **304 A**, C5 LDE,  
<https://www.spaceweather.com/images2023/31oct23/filament.gif> , [large CME](#)

**2 Nov** - NE and SW filament eruptions

**3 Nov** ~04 UT – large NW filament eruption, **304 A** , halo CME  
[https://www.spaceweather.com/images2023/03nov23/filamenteruption\\_opt.gif](https://www.spaceweather.com/images2023/03nov23/filamenteruption_opt.gif)  
<https://www.spaceweather.com/images2023/03nov23/halocme.gif>

**4-5 Nov** **G1 GEOMAGNETIC STORM**  $K_p=4.5$   $Dst=-44$   $B_z \sim -7$   
the likely source being the October 31 CME

**5-6 Nov** prolonged **G3 severe GEOMAGNETIC STORM**  $K_p=7$   $Dst=-165$   $B_z \sim -26$   
Two CMEs [hit Earth](#) -- [one](#) on Saturday, Nov. 4th, [another](#) on Sunday, Nov. 5th.

**New Anisotropic Cosmic-Ray Enhancement (ACRE) Event on 5 November 2023 Due to Complex Heliospheric Conditions.**

Gil, A., Asvestari, E., Mishev, A. et al.

Sol Phys 299, 97 (2024).

<https://doi.org/10.1007/s11207-024-02338-3>

<https://link.springer.com/content/pdf/10.1007/s11207-024-02338-3.pdf>

**6 Nov** SW near-limb filament eruption, **304 A**

**9 Nov** ~10:30 – significant central (filament) eruption, C2.6 LDE, protons J10~2.5, [a full halo CME](#) involving a filament eruption and ARs 13484, 13483 and 13480.

**13 Nov** **G1 GEOMAGNETIC STORM**  $K_p=5$   $Dst=-36$   $B_z \sim -8$

**16 Nov** ~05 UT – W-central filament eruption, halo CME ([movie](#))



**21 Nov** short-term **G1 GEOMAGNETIC STORM**  $K_p=4.2$   $Dst=-35$   $B_z\sim-13$ ,  
under the influence of effects from CH1187

**22 Nov** **G1 GEOMAGNETIC STORM**  $K_p=5$   $Dst=-28$   $B_z\sim-12$   
~06 UT – SE filament eruption '[canyon of fire](#)', partial halo CME  
~20 UT – adjacent SE filament eruption, large CME

**23 Nov** multiple NE-limb and E-disk eruptions and overlapping CMEs  
[https://www.spaceweather.com/images2023/23nov23/manycmes\\_anim\\_dec.gif](https://www.spaceweather.com/images2023/23nov23/manycmes_anim_dec.gif)

**25 Nov** **G1 with G2 interval GEOMAGNETIC STORM**  $K_p=5-6$   $Dst=-99$   $B_z\sim-16$

**26 Nov**

Temporally resolved Type III solar radio bursts in the frequency range 3-13 MHz  
[Antonio Vecchio](#), [Milan Maksimovic](#), [Nicolina Chrysaphi](#), [Eduard P. Kontar](#), [Vratislav Krupar](#)  
ApJLetter 974:L18 2024  
<https://arxiv.org/pdf/2410.18765>

**27 Nov** ~05 UT – large SW filament eruption, C-class LDE, **CME**  
[https://www.spaceweather.com/images2023/27nov23/cof\\_strip\\_opt.gif](https://www.spaceweather.com/images2023/27nov23/cof_strip_opt.gif)  
18:30 and 23:30 – two large NE eruptions of adjacent filaments, C-class LDEs, CMEs  
[https://www.spaceweather.com/images2023/27nov23/twomore\\_crop\\_strip.gif](https://www.spaceweather.com/images2023/27nov23/twomore_crop_strip.gif)  
C-class LDEs

**27-28 Nov**

Direct Observations of a Shock Traversing Preceding Two Coronal Mass Ejections:  
Insights from Solar Orbiter, Wind, and STEREO Observations

Yutian [Chi](#)<sup>1</sup>, Chenglong Shen<sup>2,3</sup>, Zhiyong Zhang<sup>4</sup>, Mengjiao Xu<sup>1</sup>, Dongwei Mao<sup>4</sup>, Junyan Liu<sup>4</sup>, Can Wang<sup>4</sup>, Bingkun Yu<sup>1</sup>, Jingyu Luo<sup>4</sup>, Zhihui Zhong<sup>4</sup>Show full author list  
2024 ApJL 975 L25  
<https://iopscience.iop.org/article/10.3847/2041-8213/ad87e8/pdf>

**28 Nov** 19:50 – **M9.8 almost-LDE flare**, AR 3500, S16W01, halo CME  
[https://www.spaceweather.com/images2023/28nov23/m9\\_teal\\_anim.gif](https://www.spaceweather.com/images2023/28nov23/m9_teal_anim.gif)  
<https://www.spaceweather.com/images2023/28nov23/halocme.gif>

The Solar Origin of an Intense Geomagnetic Storm on 2023 December 1st: Successive  
Slipping and Eruption of Multiple Magnetic Flux Ropes

[Zheng Sun](#), [Ting Li](#), [Yijun Hou](#), [Hui Tian](#), [Ziqi Wu](#), [Ke Li](#), [Yining Zhang](#), [Zhentong Li](#), [Xianyong Bai](#), [Li Feng](#), [Chuan Li](#), [Zhenyong Hou](#), [Qiao Song](#), [Jingsong Wang](#), [Guiping Zhou](#)  
Solar Phys. 2024  
<https://arxiv.org/pdf/2405.14983>

**1 Dec** **G3 two-component GEOMAGNETIC STORM**  $K_p=7$   $Dst=-107$   $B_z\sim-26$   
<https://www.spaceweather.com/images2023/01dec23/possiblytwo.jpg>  
~15 UT – SE filament eruption, bright CME  
~21:30 - SW filament eruption, M1 LDE, large CME  
A **huge CH** 1190 is directly facing Earth.

The Solar Origin of an Intense Geomagnetic Storm on 2023 December 1st: Successive  
Slipping and Eruption of Multiple Magnetic Flux Ropes

[Zheng Sun](#), [Ting Li](#), [Yijun Hou](#), [Hui Tian](#), [Ziqi Wu](#), [Ke Li](#), [Yining Zhang](#), [Zhentong Li](#), [Xianyong Bai](#), [Li Feng](#), [Chuan Li](#), [Zhenyong Hou](#), [Qiao Song](#), [Jingsong Wang](#), [Guiping Zhou](#)

Solar Phys. **299**, 93 **2024**  
<https://arxiv.org/pdf/2405.14983>  
<https://doi.org/10.1007/s11207-024-02329-4>

**4 Dec** ~17 UT – weak central S filament eruption

**6 Dec** ~05 UT - **S-shaped** central N filament eruption  
<https://www.spaceweather.com/images2023/06dec23/sigmoid.gif>

**7 Dec** ~04 UT - NE filament eruption; several CMEs during this day

**7-28 Dec**

**Global and local dynamics of X-flare-producing active regions during solar cycle 25 peak phase**

B. **Raphaldini**<sup>1\*</sup>, M. Dikpati<sup>1</sup>, A. S. W. Teruya<sup>2</sup>, K. Jain<sup>3</sup>, A. A. Norton<sup>4</sup> and S. W. McIntosh<sup>1,5</sup>  
A&A, 691, A3 (**2024**)  
<https://www.aanda.org/articles/aa/pdf/2024/11/aa51428-24.pdf>

**8 Dec** night M5 flare ([movie](#)) in SW AR3511

**12 Dec** A weak geomagnetic disturbance (Dst~ -26) started near noon. The source of the disturbance is uncertain, it could be a small negative polarity coronal hole or a transient from a CME.

**13 Dec** A faint partial halo CME was observed early in the day, likely associated with a C2.8 flare in AR 13514 at 22:55 UT on December 12.

**Spectral Properties and the Influence of Coronal Mass Ejections in 3He-rich Solar Energetic Particle Events**

Samuel T. **Hart**<sup>1,2</sup>, M. A. Dayeh<sup>1,2</sup>, R. Bučík<sup>2</sup>, G. M. Mason<sup>3</sup>, M. I. Desai<sup>1,2</sup>, R. W. Ebert<sup>1,2</sup>, G. C. Ho<sup>2</sup>, and A. A. Shmies<sup>1,2</sup>  
**2024** ApJ 974 220  
<https://iopscience.iop.org/article/10.3847/1538-4357/ad6b99/pdf>

**14 Dec** **GEOMAGNETIC STORM** Kp=4 Dst=- 81 Bz~-13

**Последовательность глобальных связанных событий:**

~06 UT – eruption of SW-limb prominence

07:44 – M5.8 flare, AR 3514, N04W41, S9~150, large W CME

>11 UT – значительное уярчение и многочасовая динамика длинной светящейся ленты вдоль NW-центрального волокна, примыкающего к комплексу ARs 3514+3520+3517;

13:48 – M2.3 вспышка на юге ARs 3514

17:18 – **STRONGEST FLARE OF THE CURRENT CYCLE, X2.8/1B flare**, type II, IV AR 3514, N04W51, S5~7700, lopsided asymmetric halo **CME**, small SEP J10~1-2

[https://www.spaceweather.com/images2023/14dec23/x3\\_teal\\_anim2.gif](https://www.spaceweather.com/images2023/14dec23/x3_teal_anim2.gif)

[https://www.spaceweather.com/images2023/14dec23/lopsidedhalo\\_dice.gif](https://www.spaceweather.com/images2023/14dec23/lopsidedhalo_dice.gif)

<https://www.spaceweather.com/images2023/16dec23/dynamicspectrum.jpg>

**15 Dec** 07:34 – one more M6.9/1N flare in AR 3514, S5~2000, type IV, halo CME

<https://www.spaceweather.com/images2023/15dec23/boomboom.jpg> SEP J10~7

~21 UT - S-central filament eruption near ARs3515-3516

Short-term **GEOMAGNETIC STORM** Kp=3-4 Dst=- 38 Bz~-12, ESP J10~14

**16-18 Dec** MULTIPLE CMEs ARE COMING [an animation of this forecast model](#)  
**G1 compound GEOMAGNETIC STORM** Kp=5.2-6 Dst=-83 Bz~-14

**24 Dec** >06 UT – длительная, многокомпонентная, значительная эрупция высокоширотного и продолжающегося в NW секторе крупного [волокна](#), ;  
16 UT – ещё эрупция в SW секторе;  
В течение дня несколько значительных [CMEs](#) и M-вспышек

**25 Dec** Несколько существенных эрупций в центральном и SW секторах, CMEs

**29-31 Dec**

**Global and local dynamics of X-flare-producing active regions during solar cycle 25 peak phase**

B. [Raphaldini](#)<sup>1\*</sup>, M. Dikpati<sup>1</sup>, A. S. W. Teruya<sup>2</sup>, K. Jain<sup>3</sup>, A. A. Norton<sup>4</sup> and S. W. McIntosh<sup>1,5</sup>  
A&A, 691, A3 (2024)

<https://www.aanda.org/articles/aa/pdf/2024/11/aa51428-24.pdf>

**31 Dec** >08 UT – NW filament eruption

21:55 – X5.0/3B near E limb flare, S9~6400, IV/2, [CME](#), SEP J10~2, [NASA model](#)

[https://www.spaceweather.com/images2023/31dec23/x5\\_teal.jpg](https://www.spaceweather.com/images2023/31dec23/x5_teal.jpg)

[https://www.spaceweather.com/images2023/31dec23/tsunami2\\_red.gif](https://www.spaceweather.com/images2023/31dec23/tsunami2_red.gif)

**Triangulation of Hard X-Ray Sources in an X-Class Solar Flare with ASO-S/HXI and Solar Orbiter/STIX.**

[Ryan](#), D.F., Massa, P., Battaglia, A.F. et al.

Sol Phys 299, 114 (2024).

<https://doi.org/10.1007/s11207-024-02341-8>

<https://link.springer.com/content/pdf/10.1007/s11207-024-02341-8.pdf>