

See <https://www.spaceweather.com> <https://www.solarmonitor.org>

See STEREO sites: CME Catalog <http://cor1.gsfc.nasa.gov/catalog/>

EUVI flares http://www.lmsal.com/nitta/movies/flares_euvi/

January - December 2006

1 Jan – 21:40 UT: NW-limb C1.5 LDE, large CME, dimmings

+5 Jan – 09:20 UT: NW-near-limb C4.4 LDE, CME, dimmings
++09:20 UT: clear type II burst at our spectrum
W57 without protons

9-12 Jan

The formation of an equatorial coronal hole

Liheng **Yang**¹, Yunchun Jiang¹ and Jun Zhang²

Solar and Stellar Variability: Impact on Earth and Planets, Proceedings IAU Symposium No. 264, 2009, p. 295-297, A.G. Kosovichev, A.H. Andrei & J.-P. Rozelot, eds.

Y:\obridko\otchet09

+12 Jan, >23 UT – noticeable central filament eruption; CW?, CME; See Events!

8 Feb

Quiet-Sun Explosive Events Observed in He ii $\lambda 304$ with MOSES-06

Thomas **Rust** and Charles C. Kankelborg

2019 ApJ 877 59

sci-hub.se/10.3847/1538-4357/ab12e2

10 Feb

RATAN-600 Observations of Small Scale Structures with High Spectral Resolution

V. M. **Bogod**, C. E. Alissandrakis, T. I. Kaltman, S. Kh. Tokhchukova

Solar Phys., 2014

<http://arxiv.org/pdf/1403.7658v1.pdf>

21 Feb

Near-orthogonal Orientation of Small-scale Magnetic Flux Ropes Relative to the Background Interplanetary Magnetic Field

Kyung-Eun **Choi**¹, Dae-Young Lee¹, Katsuhide Marubashi², and Seunguk Lee¹

2022 ApJ 931 98

<https://iopscience.iop.org/article/10.3847/1538-4357/ac69d3/pdf>

1 March

Observational evidence for local particle acceleration associated with magnetically confined magnetic islands in the heliosphere – a **review**

Olga V. **Khabarova**¹, Gary P. Zank^{2,3}, Olga E. Malandraki⁴, Gang Li^{2,3}, Jakobus A. le Roux^{2,3}, Gary M. Webb

Sun and Geosphere, 2017; 12/1: 23 -30

http://newserver.stil.bas.bg/SUNGEO/00SGArhiv/SG_v12_No1_2017-pp-23-30.pdf

9 March

The Sun and Space Weather

Nat Gopalswamy

Atmosphere, vol. 13, issue 11, p. 1781, 2022 **File**

<https://www.mdpi.com/2073-4433/13/11/1781/pdf?version=1666956880>

<https://doi.org/10.3390/atmos13111781>

Review

<https://arxiv.org/ftp/arxiv/papers/2211/2211.06775.pdf>

29 March Eclipse

АНАЛИЗ ФИЗИЧЕСКИХ ХАРАКТЕРИСТИК ПОЛЯРНОЙ КОРОНАЛЬНОЙ ДЫРЫ НА СОЛНЦЕ В МИКРОВОЛНОВОМ ДИАПАЗОНЕ ДЛИН ВОЛН

Голубчина О.А.

ГИА Том: 62Номер: 1 Год: 2022 Страницы: 11-18

АНАЛИЗ РЕЗУЛЬТАТОВ ИССЛЕДОВАНИЯ НАБЛЮДЕНИЙ ПОЛЯРНОЙ КОРОНАЛЬНОЙ ДЫРЫ НА СОЛНЦЕ В МИКРОВОЛНОВОМ ДИАПАЗОНЕ ДЛИН ВОЛН

ГОЛУБЧИНА О. А.

АЖ Том: 98Номер: 4 Год: 2021 Страницы: 332-341

Extended MHD modeling of the steady solar corona and the solar wind

Review

Tamas I. **Gombosi**, Bart van der Holst, Ward B. Manchester, Igor V. Sokolov

[Living Reviews in Solar Physics](#) December 2018, 15:4

<https://link.springer.com/content/pdf/10.1007%2Fs41116-018-0014-4.pdf>

<https://arxiv.org/pdf/1807.00417.pdf>

Using a New Infrared Si x Coronal Emission Line for Discriminating between Magnetohydrodynamic Models of the Solar Corona During the 2006 Solar Eclipse

Gabriel I. **Dima**^{1,2}, Jeffrey R. Kuhn¹, Don Mickey¹, and Cooper Downs

2018 ApJ 852 23

Orientation of the linear polarization plane of H-alpha emission in prominences

E.Z. **Suyunova**, I.S. Kim, A.R. Osokin

Proceedings of the All-Russian annual conference "Solar and Solar-Terrestrial Physics-2014", 2014, St Petersburg State University, p. 403-406

<http://arxiv.org/ftp/arxiv/papers/1502/1502.04637.pdf>

6 Apr

Study of temporal and spectral characteristics of the X-ray emission from solar flares

[Veena Choithani](#), [Rajmal Jain](#), [Arun Kumar Awasthi](#), [Geetanjali Singh](#), [Sneha Chaudhari](#), [Som Kumar Sharma](#)

Research in Astronomy and Astrophysics (RAA)

2018

<https://arxiv.org/pdf/1804.08431.pdf>

The structure of solar radio noise storms

Claude **Mercier**, Prasad Subramanian, Gilbert Chambe, P. Janardhan

A&A, 2015

<http://arxiv.org/pdf/1412.8189v2.pdf>

10 Apr

Investigating the observational signatures of magnetic cloud substructure

Steed, K.; Owen, C. J.; Demoulin, P.; Dasso, S.

J. Geophys. Res., Vol. 116, No. A1, A01106, 2011

12-15 Apr

A Time-Efficient, Data Driven Modelling Approach To Predict The Geomagnetic Impact of Coronal Mass Ejections

Souvik **Roy**, [Dibyendu Nandy](#)

GRL 2022

<https://arxiv.org/pdf/2210.00071.pdf>

Identifying Flux Rope Signatures Using a Deep Neural Network

Luiz F. G. dos [Santos](#), [Ayrís Narock](#), [Teresa Nieves-Chinchilla](#), [Marlon Nuñez](#), [Michael Kirk](#)
Solar Phys. 2020
<https://arxiv.org/pdf/2008.13294.pdf>

+25 Apr, 06:45 - **drifting CONT**, Clear SE-limb CME, dimmings! See Events!

+27 Apr, 15:52 - 1N/M7.9 quasi-impulsive flare? Perhaps without a CME;
See Events

НОВЫЕ НАПРАВЛЕНИЯ В ФИЗИКЕ СОЛНЕЧНЫХ ВСПЫШЕК

10 minute review

Б.В. [Сомов](#)

ИКИ-2014, Сессия: Солнце

<http://plasma2014.cosmos.ru/presentations>

On the magnetic reconnection of electric currents in solar flares

B. V. [Somov](#)

Astronomy Letters, Volume 38, Number 2, 128-138, 2012

Astronomicheskii Zhurnal, 2012, Vol. 38, No. 2, pp. 149–160.

Transient induced MHD oscillations : A tool to probe the solar active regions

[Srivastava](#), Abhishek K.; Nakariakov, V. M.; Dwivedi, B. N.; Kumar, Pankaj

E-print, Oct 2011. Proc. of the 1st Asian-Pacific Solar Phys. Meeting

Evidence of Solar Flare Triggering due to Loop-Loop Interaction Caused by Footpoint Shear-Motion

[Kumar](#), Pankaj; [Srivastava](#), A. K.; [Somov](#), B. V.; [Manoharan](#), P. K.; [Erdelyi](#), R.; [Uddin](#), Wahab

E-print, Sept 2010, ApJ, ApJ 723 1651-1664, 2010

28 Apr

From Polarimetry to Helicity: Studies of Solar Magnetic Fields at the Huairou Solar Observing Station Review

Hongqi [Zhang](#)

SCIENCE CHINA Physics, Mechanics & Astronomy

2019

<https://arxiv.org/pdf/1912.06557.pdf>

+30 Apr, 09:22 - Impulsive C1.6 flare, dimmings; See Events!
Clear classic type II burst at our spectrum

+1 May, >14 UT - C1 LDE, faint halo CME, **Slowly expanding dimmings**, See Events!

Active-Region Tilt Angles from White-Light Images and Magnetograms: The Role of Magnetic Tongues

M. [Poisson](#), [P. Démoulin](#), [C.H. Mandrini](#), [M.C. López Fuentes](#)

ApJ 2020

<https://arxiv.org/pdf/2004.07345.pdf>

Gradual Inflation of Active-Region Coronal Arcades Building up to Coronal Mass Ejections

Rui [Liu](#), Chang Liu, Sung-Hong Park and Haimin Wang

BBSO preprint #1433, Astrophysical Journal, 723:229–240, 2010, File

+4 May, .01 UT - A partial halo CME was observed in LASCO images early in the day following a **filament eruption** near spotless region 10876; propagating **absorption** at 195 Å and on one frame at 304 Å; See Events!

22 May

From Polarimetry to Helicity: Studies of Solar Magnetic Fields at the Huairou Solar Observing Station

Review

Hongqi **Zhang**

SCIENCE CHINA Physics, Mechanics & Astronomy

2019

<https://arxiv.org/pdf/1912.06557.pdf>

3 July

О РЕГИСТРАЦИИ ХОЛОДНОГО ВЕЩЕСТВА В ОБЛАСТИ СИЛЬНОГО МАГНИТНОГО ПОЛЯ СОЛНЕЧНЫХ ПЯТЕН И ИСТЕЧЕНИЕ ПЛАЗМЫ В КОРОНУ

В.М. **Бород**, Н.Г. Петерова, Б.И. Рябов, Н.А. Топчило

ИКИ-2014 Сессия: Солнце

<http://plasma2014.cosmos.ru/presentations>

4 July

STUDY OF MAGNETIC HELICITY IN SOLAR ACTIVE REGIONS AND ITS RELATIONSHIP WITH SOLAR ERUPTIONS

Sung-Hong **Park**

Thesis, 2010, File

Gradual Inflation of Active-Region Coronal Arcades Building up to Coronal Mass Ejections

Rui **Liu**, Chang Liu, Sung-Hong Park and Haimin Wang

BBSO preprint #1433, Astrophysical Journal, 723:229–240, 2010, File

Multi-wavelength fine structure and mass flows in solar microflares

Berkebile-Stoiser, S. ; G?m?ry, P.; Veronig, A.M.; Ryb?ak, J.; S?tterlin, P.

E-print, Aug 2009

++6 July - M2.5/2F LDE flare at 08:36 UTC. This event was associated with type II and IV radio sweeps and a minor proton enhancement. A large full halo CME was observed after the M2 event in region 10898. Nice 4-line dimmings and CW. Nice type II **3-harmonic** burst at our spectrum. See Events!!!

Antenna Performance Analysis for Decameter Solar Radio Observations

Aleksander Stanislavsky, Aleksander Konovalenko, [Eduard Abranin](#), [Vladimir Dorovskyy](#), [Valentin Mel'nik](#), [Michael Kaiser](#), [Alain Lecacheux](#), [Helmut Rucker](#)

Astronomische Nachrichten 330, 691(2009)

<http://arxiv.org/pdf/1111.3226v1.pdf>

НАБЛЮДЕНИЯ ЖЕСТКОГО РЕНТГЕНОВСКОГО ИЗЛУЧЕНИЯ СЛАБЫХ ВСПЫШЕК

И.Ю. **Григорьева**, М.А. Лившиц

ИКИ-2014, Сессия: Солнце

<http://plasma2014.cosmos.ru/presentations>

Initiation of Coronal Mass Ejections by Sunspot Rotation

Torok, T., Temmer, M., Valori, G., Veronig, A. M., van Driel-Gesztelyi, L., Vrsnak, B.

E-print, Feb 2013, File; Solar Phys.

Связь нетепловых и газодинамических процессов в мощных солнечных вспышках

Лившиц М.А.1, Кашапова Л.К.

2012

СВЯЗЬ ВЫСОКОЭНЕРГИЧНЫХ ПРОЦЕССОВ ВО ВСПЫШКАХ И ФОРМИРОВАНИЯ БЫСТРЫХ КОРОНАЛЬНЫХ ВЫБРОСОВ

Л.К. **Кашапова**1, М.А. Лившиц2, И.Ю. Григорьева3, В.Н. Боровик3

MULTIWAVELENGTH IMAGING AND SPECTROSCOPY OF CHROMOSPHERIC EVAPORATION IN AN M-CLASS SOLAR FLARE

A. M. **Veronig** 1, J. Rybák 2, P. Gömöry 2,3, S. Berkebile-Stoiser 1, M. Temmer 1,4, W. Otruba 3, B. Vršnak 5, W. Pötzi 3 and D. Baumgartner
2010 ApJ 719 655

A FLUX ROPE ERUPTION TRIGGERED BY JETS

Juan **Guo**1, Yu Liu2, Hongqi Zhang1, Yuanyong Deng1, Jiaben Lin1, and Jiangtao Su1
Astrophysical Journal, 711:1057–1061, 2010 March

Temporal comparison of nonthermal flare emission and magnetic-flux change rates:

C.H.**Miklenic**, A.M.Veronig and B.Vrsnak
E-print, Oct 2009, **File**; A&A 499 (2009) 893-904

The Recovery of CME-Related Dimmings and the ICME's Enduring Magnetic Connection to the Sun

G.D.R. **Attrill**· L. van Driel-Gesztelyi1·P. D'emoulin· A.N. Zhukov,· K. Steed, L.K. Harra· C.H. Mandrini6· J. Linker7
E-print, July 2008, **File**; Solar Phys.

THE POSTERUPTIVE EVOLUTION OF A CORONAL DIMMING

Scott W. **McIntosh**,1, 2 Robert J. Leamon,3 Alisdair R. Davey,1 and Meredith J. Wills-Davey
The Astrophysical Journal, 660:1653-1659, 2007, **File**

ACCELERATION IN FAST HALO CMEs AND SYNCHRONIZED FLARE HXR BURSTS

M. **Temmer**, A. M. Veronig, B. Vrsnak, J. Rybák, P. Gömöry, S. Stoiser, and D. Maricic
The Astrophysical Journal, 673: L95–L98, 2008, **File**

9 July

Predicting the Geoeffectiveness of CMEs Using Machine Learning

[Andreea-Clara Pricopi](#), [Alin Razvan Paraschiv](#), [Diana Besliu-Ionescu](#), [Anca-Nicoleta Marginean](#)
ApJ 2022
<https://arxiv.org/pdf/2206.11472.pdf>

13 July

Flare Observations

Review

Arnold O. **Benz**

[Living Reviews in Solar Physics](#) December 2017?, 14:2 **File**

This article is a revised version of <http://dx.doi.org/10.12942/lrsp-2008-1>.
<https://link.springer.com/content/pdf/10.1007%2Fs41116-016-0004-3.pdf>

+20 July

- 08 UT: significant SW eruption, dimmings; See Event!

+12 UT: **large filament eruption** in SE quadrant **at 171 Å**; **4-line dimmings**; See Event!!

4 Aug

The Sun and Space Weather

Review

[Nat Gopalswamy](#)

Atmosphere, vol. 13, issue 11, p. 1781, 2022 **File**

<https://www.mdpi.com/2073-4433/13/11/1781/pdf?version=1666956880>

<https://doi.org/10.3390/atmos13111781>

<https://arxiv.org/ftp/arxiv/papers/2211/2211.06775.pdf>

11-18 Aug

LOW-FREQUENCY OBSERVATIONS OF POLARIZED EMISSION FROM LONG-LIVED NON-THERMAL RADIO SOURCES IN THE SOLAR CORONA

R. **Ramesh**, C. Kathiravan and A. Satya Narayanan

2011 ApJ 734 39,

13 Aug

Lambda-shaped jets from a penumbral intrusion into a sunspot umbra: a possibility for magnetic reconnection*

L. **Bharti**^{1,2}, S. K. Solanki^{1,3} and J. Hirzberger

A&A 597, A127 (2017)

http://www.aanda.org/articles/aa/full_html/2017/01/aa29656-16/aa29656-16.html

Magnetic reconnection as a source of jets from a penumbral intrusion into a sunspot umbra

L. **Bharti**, S. K. Solanki, J. Hirzberger

ApJ 2015

<http://arxiv.org/pdf/1509.02123v1.pdf>

+16 Aug -16 UT: C3.6 LDE, large halo CME, **4-line dimmings**, accompanied by Forbush and geostorm; see Events!!

(18-24 Aug)

Multipoint, high time resolution galactic cosmic ray observations associated with two interplanetary coronal mass ejections

Jordan, A. P.; Spence, H. E.; Blake, J. B.; Mulligan, T.; Shaul, D. N. A.; Galametz, M. J. Geophys. Res., Vol. 114, No. A7, A07107, 2009

Short-period variability in the galactic cosmic ray intensity: High statistical resolution observations and interpretation around the time of a Forbush decrease in August 2006

Mulligan, T.; Blake, J. B.; Shaul, D.; Quenby, J. J.; Leske, R. A.; Mewaldt, R. A.; Galametz, M.

J. Geophys. Res., Vol. 114, No. A7, A07105, 2009

<http://dx.doi.org/10.1029/2008JA013783>

22 Aug

Homologous prominence non-radial eruptions: A case study

P. **Duchlev**, K. Kolevaa, M. S. Madjarska, M. Dechev

New Astronomy 2016

<http://arxiv.org/pdf/1605.02299v1.pdf>

23-29 Aug

LOW-FREQUENCY OBSERVATIONS OF POLARIZED EMISSION FROM LONG-LIVED NON-THERMAL RADIO SOURCES IN THE SOLAR CORONA

R. **Ramesh**, C. Kathiravan and A. Satya Narayanan

2011 ApJ 734 39,

24 Aug

What are the physical mechanisms of eruptions and CMEs?

Brigitte **Schmieder**, , Guillaume Aulanier

Advances in Space Research, Volume 49, Issue 11, 1 June 2012, Pages 1598–1606, **Take**

26 August - The C2.5 event late on August 26 in region 10905 was associated with at least a partial halo CME. Most of the ejected material was observed over the southern limbs. EIT bakeout.

Magnetic causes of the eruption of a quiescent filament

B. **Schmieder**¹, V. Bommier², Y. Kitai³, T. Matsumoto³, T.T. Ishii³, M. Hagino³, H. Li⁴, L. Golub⁵

E-print, Nov 2007, Solar Phys. (2008) 247: 321–333, file

+1 Sept 2006 - 06-08 UT: drift fine-structure activity (CONT) at our and Hiraiso spectra associated with C1 LDE. EIT bakeout.

~10 Sept

ДИНАМИКА МАГНИТНОГО ПОЛЯ АКТИВНЫХ ОБЛАСТЕЙ В ПРЕДВСПЫШЕЧНОМ СОСТОЯНИИ И ВО ВРЕМЯ СОЛНЕЧНЫХ ВСПЫШЕК

ПОДГОРНЫЙ А.И.1, ПОДГОРНЫЙ И.М.2, МЕШАЛКИНА Н.С.

АЖ Том: 92 Номер: 8 Год: 2015 Страницы: 669

11 September

Possible Cool Prominence Materials Detected within Interplanetary Small Magnetic Flux Ropes

J. M. **Wang**^{1,2}, H. Q. Feng¹, H. B. Li¹, A. K. Zhao¹, Z. J. Tian¹, G. Q. Zhao¹, Y. Zhao¹, and Q. Liu¹
2019 ApJ 876 57

sci-hub.se/10.3847/1538-4357/ab148b

23 Sept 2006 - ~11:10: Type II(1) at our spectrograph

30 September

CORONAL RADIATION BELTS

H. S. **Hudson**¹, A. L. MacKinnon², M. L. DeRosa³, and S. F. N. Frewen¹

Astrophysical Journal, 698:L86-L89, 2009

<http://www.iop.org/80/EJ/toc/-alert=43191/1538-4357/698/2>

20 Oct-14 Nov 2006

Time-Window Approaches to Space-Weather Forecast Metrics: A Solar Wind Case Study

Mathew J. **Owens**

Space Weather Volume16, Issue11 November 2018 Pages 1847-1861

<http://sci-hub.tw/10.1029/2018SW002059>

31 Oct 2006 - morning E activity and halo CME

+5 Nov 2006 - two C-class flares

~17 UT: E-limb eruption, CW and halo CME

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>

6 Nov 2006 -

A total of 2 C class events was recorded during the day. A C2.4 long duration event peaking at 10:51 and a C8.8 flare at 17:46 UTC both had their origin in a very active region just behind the east limb. Both events were associated with CMEs, the C8.8 flare was followed by a large full halo CME. The region behind the east limb is capable of M class flaring and could rotate partly into view later today.

Spectacular CME-associated deviations of a streamer.

Solar Energetic Particles and Associated EIT Disturbances in Solar Cycle 23

R. **Miteva**, K.-L. Klein, I. Kienreich, M. Temmer, A. Veronig, O. E. Malandraki

E-print, Feb 2014, File; Solar Phys.

<http://arxiv.org/pdf/1402.1676v1.pdf>

Streamer Wave Events Observed in Solar Cycle 23

S. W. [Feng](#), Y. Chen, B. Li, H. Q. Song, X. L. Kong, L. D. Xia and X. S. Feng
Solar Phys (2011) 272:119–136, [File](#)

10 Nov 2006

THREE-DIMENSIONAL STRUCTURE OF A SOLAR ACTIVE REGION FROM SPATIALLY AND SPECTRALLY RESOLVED MICROWAVE OBSERVATIONS

Samuel D. [Tun1](#), Dale E. Gary1, and Manolis K. Georgoulis2
Astrophysical Journal, 728:1 (16pp), 2011 February

12 Nov 2006

Post-flare evolution of AR 10923 with Hinode/XRT

S. [Parenti](#), F. Reale and K. K. Reeves
A&A 517, A41 (2010)

Two-Step Reconnections in a C3.3 Flare and Its Preflare Activity Observed by Hinode XRT

S. [Kim](#), Y.-J. Moon, K.-H. Kim, Y.-H. Kim, T. Sakurai, J. Chae, K.-S. Kim, and G. Choe
Publ. Astron. Soc. Japan 59, pp.S831-S836 (2007)

[Abstract], [HTML], [[PDF\(526kb\)](#)], [[PS.gz\(4321kb\)](#)]

We investigated the evolution of a C3.3 impulsive flare and its preflare activity, which occurred in NOAA Active Region 10923 on 2006 November 12, using Hinode X-Ray Telescope (XRT) data.

13 Nov

A Bayesian Approach to Period Searching in Solar Coronal Loops

Bryan [Scherrer](#)1 and David McKenzie
2017 ApJ 837 24

14 Nov

Similarities of magnetoconvection in the umbra and in the penumbra of sunspots

B. [Löptien](#)1, A. Lagg1,3, M. van Noort1 and S. K. Solanki1,2
A&A 655, A61 (2021)

<https://www.aanda.org/articles/aa/pdf/2021/11/aa41440-21.pdf>

<https://doi.org/10.1051/0004-6361/202141440>

<https://arxiv.org/pdf/2110.01352.pdf>

Combining magneto-hydrostatic constraints with Stokes profile inversions. II. Application to Hinode/SP observations

[J.M.Borrero](#), [A. Pastor Yabar](#), [B. Ruiz Cobo](#)

A&A 2021

<https://arxiv.org/pdf/2101.04394.pdf>

No universal connection between the vertical magnetic field and the umbra-penumbra boundary in sunspots

B. [Löptien](#), [A. Lagg](#), [M. van Noort](#), [S. K. Solanki](#)

A&A 2020

<https://arxiv.org/pdf/2006.02346.pdf>

17 Nov

Efficiency of solar microflares in accelerating electrons when rooted in a sunspot★

Jonas [Saqr](#)1, Astrid M. Veronig1,2, Andrea Francesco Battaglia3,4, Ewan C. M. Dickson1, Dale E. Gary5 and Säm Krucker3,6

A&A 683, A41 (2024)

<https://arxiv.org/pdf/2312.06856.pdf>

<https://www.aanda.org/articles/aa/pdf/2024/03/aa48295-23.pdf>

<https://doi.org/10.1051/0004-6361/202348295>

18 Nov 2006

Coronal Jet Observed by Hinode As The Source Of A ^3He -rich Solar Energetic Particle Event

Nariaki V. Nitta¹, Glenn M. Mason², Mark E. Wiedenbeck^{3,4}, Christina M. S. Cohen⁴, Saïm Krucker⁵, Iain G. Hannah⁵, Masumi Shimojo⁶ and Kazunari Shibata⁷

E-print, Feb 2008; ApJL, 675:L125–L128, **2008** March 10

<http://www.journals.uchicago.edu/doi/pdf/10.1086/533438>

We study the solar source of the ^3He -rich solar energetic particle (SEP) event observed on 2006 November 18.

20 Nov 2006

SYSTEMATIC MOTION OF FINE-SCALE JETS AND SUCCESSIVE RECONNECTION IN SOLAR CHROMOSPHERIC ANEMONE JET OBSERVED WITH THE SOLAR OPTICAL TELESCOPE/HINODE

K. A. P. Singh¹, H. Isobe², K. Nishida¹, and K. Shibata

2012 ApJ 760 28

21 Nov 2006

Abundance Enhancements in Impulsive Solar Energetic-Particle Events with Associated Coronal Mass Ejections

Donald V. Reames, Edward W. Cliver, Stephen W. Kahler

Solar Phys., **2014**

<http://arxiv.org/pdf/1404.3322v1.pdf>

RHESSI AND HINODE X-RAY OBSERVATIONS OF A PARTIALLY OCCULTED SOLAR FLARE

Saïm Krucker¹, I. G. Hannah¹ and R. P. Lin^{1,2}

The Astrophysical Journal, 671: L193–L196, **2007**

<http://www.journals.uchicago.edu/doi/pdf/10.1086/525019>

CORONAL HARD X-RAY EMISSION ASSOCIATED WITH RADIO TYPE III BURSTS

Saïm Krucker¹, P. Saint-Hilaire¹, S. Christe^{1,2}, S. M. White³

A. D. Chavier⁴, S. D. Bale^{1,2} and R. P. Lin^{1,2}

The Astrophysical Journal, 681:644–649, **2008**

<http://www.journals.uchicago.edu/doi/pdf/10.1086/588549>

21–23 Nov

Four Distinct Pathways to the Element Abundances in Solar Energetic Particles **Review**

Donald V. Reames

Space Sci. Rev **2019**

<https://arxiv.org/ftp/arxiv/papers/1912/1912.06691.pdf>

22 Nov

Power spectrum analysis of limb and disk spicule using Hinode Ca H line broadband filter

Ehsan Tavabi

Astrophysics and Space Science, **2014**

<http://arxiv.org/pdf/1403.6660v1.pdf>

23 Nov

X-Ray Jet Dynamics in a Polar Coronal Hole Region

Boris Filippov · Leon Golub · Serge Koutchmy

Solar Phys (**2009**) 254: 259–269, **File**

30 Nov

The magnetic Rayleigh–Taylor instability in solar prominences **Review**

Andrew **Hillier**

[Reviews of Modern Plasma Physics](#) December 2018, 2:1

<https://link.springer.com/content/pdf/10.1007%2Fs41614-017-0013-2.pdf>

Prominence oscillations

Review

Iñigo **Arregui**, Ramón Oliver, José Luis Ballester

[Living Reviews in Solar Physics](#) December 2018, 15:3 **File**

<http://sci-hub.tw/http://link.springer.com/10.1007/s41116-018-0012-6>

Analysis of Flows Inside Quiescent Prominences as Captured by Hinode/Solar Optical Telescope

M. S. **Freed**, D. E. McKenzie, D. W. Longcope, and M. Wilburn

ApJ 2016 818 57

<http://arxiv.org/pdf/1602.03821v1.pdf>

Vigorous convection in a sunspot granular light bridge

Andreas **Lagg** (1), Sami K. Solanki (1 and 2), Michiel van Noort (1), Sanja Danilovic A&A, 2014

<http://arxiv.org/pdf/1407.1202v1.pdf>

TURBULENT CHARACTERISTICS IN THE INTENSITY FLUCTUATIONS OF A SOLAR QUIESCENT PROMINENCE OBSERVED BY THE HINODE SOLAR OPTICAL TELESCOPE

E. **Leonardis**, S. C. Chapman and C. Foullon

2012 ApJ 745 185

30 Nov-3 Dec

Apparent and Intrinsic Evolution of Active Region Upflows

Deborah **Baker**, Miho Janvier, Pascal Démoulin, Cristina H. Mandrini

Solar Physics April 2017, 292:46

<http://link.springer.com/article/10.1007/s11207-017-1072-9>

1-2 Dec

The Creation of Outflowing Plasma in the Corona at Emerging Flux Regions: Comparing Observations and Simulations

L. K. Harra, V. Archontis, E. Pedram, A. W. Hood and D. L. Shelton, et al.

Solar Phys. Volume 278, Number 1, 2012

5 - ? Dec - Strong activity with X-class flares

See http://www.swpc.noaa.gov/sites/default/files/images/u33/Rutledge_SWW_2016.pdf

Extreme Solar Events: Setting up a Paradigm

Review

Usoskin, I., Miyake, F., Baroni, M. et al.

Space Sci Rev 219, 73 (2023).

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Measurements and Modeling of Total Solar Irradiance in X-Class Solar Flares

Christopher Samuel **Moore**, Phillip Clyde Chamberlin, Rachel Hock

2015

<http://arxiv.org/pdf/1509.06074v1.pdf>

Force-field parameterization of the galactic cosmic ray spectrum: Validation for Forbush decreases

I.G. **Usoskin**, [G.A. Kovaltsov](#), [O. Adrianid](#), [e](#), [G.C. Barbarinof](#), [g](#), [G.A. Bazilevskayah](#), et al.

Study of the Forbush Decreases, Geomagnetic Storms, and Ground-Level Enhancements in Selected Intervals and Their Space Weather Implications

Badruddin, Anand **Kumar**
Solar Phys. 2015

MAGNETIC NON-POTENTIALITY OF SOLAR ACTIVE REGIONS AND PEAK X-RAY FLUX OF THE ASSOCIATED FLARES

Sanjiv Kumar **Tiwari**, P. Venkatakrishnan, and Sanjay Gosain
Astrophysical Journal, 721:622–629, 2010 September, **File**

Effect of intense December 2006 solar radio bursts on GPS receivers

Cerruti, Alessandro P.; Kintner, Paul M., Jr.; Gary, Dale E.; Mannucci, Anthony J.; Meyer, Robert F.; Doherty, Patricia; Coster, Anthea J.
Space Weather, Vol. 6, No. 10, S10D07, 2008
<http://dx.doi.org/10.1029/2007SW000375>
<http://onlinelibrary.wiley.com/doi/10.1029/2007SW000375/pdf>

5 Dec - Unusually for this point in the cycle, there was an **X9.0** LDE from a large and as yet unnumbered region on **the east limb at 10:18 UT** today.
IIIGG + II? at our event
EIT bakeout

Energetic Neutral Hydrogen from Large Solar Flares

Glenn **MASON**
RHESSI Science Nuggets №435 2022
https://sprg.ssl.berkeley.edu/~tohban/wiki/index.php/Energetic_Neutral_Hydrogen_from_Large_Solar_Flares

Evidence for Energetic Neutral Hydrogen Emission from Solar Particle Events

G. M. **Mason**¹, M. E. Greenspan^{7,2}, S. G. Kanekal³, R. A. Leske⁴, M. D. Looper⁵, J. E. Mazur⁶, and R. A. Mewaldt⁴
2021 ApJ 923 195
<https://iopscience.iop.org/article/10.3847/1538-4357/ac2fa2/pdf>
<https://doi.org/10.3847/1538-4357/ac2fa2>

Chapter 12 - Extreme Space Weather Events: A GOES Perspective

Review

William F. **Denig***[Daniel Wilkinson](#)*[†Robert J. Redmon](#)*
In: [Extreme Events in Geospace](#) Origins, Predictability, and Consequences 2018, Pages 283-347
<http://sci-hub.tw/10.1016/B978-0-12-812700-1.00012-1>

Large gradual solar energetic particle events

Review

Mihir **Desai**, Joe Giacalone
Living Reviews in Solar Physics, December 2016, 13:3
<http://solarphysics.livingreviews.org/>

НАБЛЮДЕНИЯ ЖЕСТКОГО РЕНТГЕНОВСКОГО ИЗЛУЧЕНИЯ СЛАБЫХ ВСПЫШЕК

И.Ю. **Григорьева**, М.А. Лившиц
ИКИ-2014, Сессия: Солнце
<http://plasma2014.cosmos.ru/presentations>

Location of Decimetric Pulsations in Solar Flares

Arnold O. **Benz**, Marina Battaglia and Nicole Vilmer
Solar Physics, Volume 273, Number 2, 363-375, 2011

Energetic neutral atoms from the Sun: an alternative interpretation of a unique event ★

G. M. [Simnett](#)

A&A 531, A46 (2011)

Decimetric pulsations and coronal X-ray sources

A. [Benz](#), M. Battaglia, and N. Vilmer

RHESSI Science Nugget, No 150, April 2011

http://sprg.ssl.berkeley.edu/~tohban/wiki/index.php/Decimetric_pulsations_and_coronal_X-ray_sources

STEREO OBSERVATIONS OF ENERGETIC NEUTRAL HYDROGEN ATOMS DURING THE 2006 DECEMBER 5 SOLAR FLARE

R. A. [Mewaldt](#), R. A. Leske, E. C. Stone, A. F. Barghouty, A. W. Labrador, C. M. S. Cohen, A. C. Cummings, A. J. Davis, T. T. von Roseninge, and M. E. Wiedenbeck

ApJL 693 L11-L15, 2009

<http://www.iop.org/EJ/abstract/1538-4357/693/1/L11>

We report the discovery of energetic neutral hydrogen atoms (ENAs) emitted during the X9 solar event of **2006 December 5**.

Particle Observations and Propagation in the Three-Dimensional Heliosphere

O.E. Malandraki, R.G. Marsden, T.R. Sanderson, C. Tranquille, R.J. Forsyth, H.A. Elliott, L.J. Lanzerotti, A. Geranios, E.T. Sarris, B. Heber and R. Mueller-Mellin

BBSO, #1336, 2007

Ulysses, Dec 2006

6 Dec - 08:23 UT - **Our M6 flare**

18:47 UT - **3B/X6.5 LDE flare**

http://www.lmsal.com/solarsoft/latest_events_summary/gev_20061206_1829/gev_20061206_1829_sxilm.html

http://www.heliotown.com/Radio_Sun_Introduction.html

Solar tsunami <http://www.nso.edu/staff/dooling/tsunami/>

<http://www.nso.edu/press/tsunami/>

Electron Cyclotron Maser Emission and the Brightest Solar Radio Bursts

[Stephen M. White](#), [Masumi Shimojo](#), [Kazumasa Iwai](#), [Timothy S. Bastian](#), [Gregory D. Fleishman](#), [Dale E. Gary](#), [Jasmina Magdalenic](#), [Angelos Vourlidas](#)

ApJ 2024

<https://arxiv.org/pdf/2405.01755>

MHD Simulation of Homologous Eruptions from Solar Active Region 10930 Caused by Sunspot Rotation

[Xinyi Wang](#), [Chaowei Jiang](#), [Xueshang Feng](#), [Aiyang Duan](#), [Xinkai Bian](#)

ApJ 2022

<https://arxiv.org/pdf/2208.08957.pdf>

Extreme solar events

Review

[Edward W. Cliver](#), [Carolus J. Schrijver](#), [Kazunari Shibata](#) & [Ilya G. Usoskin](#)

[Living Reviews in Solar Physics](#) volume 19, Article number: 2 (2022)

<https://link.springer.com/content/pdf/10.1007/s41116-022-00033-8.pdf>

КОСМИЧЕСКАЯ ПОГОДА: ФАКТОРЫ РИСКА ДЛЯ ГЛОБАЛЬНЫХ НАВИГАЦИОННЫХ СПУТНИКОВЫХ СИСТЕМ

Review

[Демьянов В.В.](#), [Ясюкевич Ю.В.](#)

[СОЛНЕЧНО-ЗЕМНАЯ ФИЗИКА Том 7 № 2, 2021](#), С. 24–29

<https://naukaru.ru/ru/storage/viewWindow/72945>

Detection of Energy Cutoffs in Flare-accelerated Electrons

Fanxiaoyu [Xia](#)^{1,2}, Yang Su^{1,2}, Wen Wang³, Linghua Wang³, Alexander Warmuth⁴, Weiqun Gan^{1,2}, and Youping Li^{1,2}
2021 ApJ 908 111
<https://iopscience.iop.org/article/10.3847/1538-4357/abce5c/pdf>

Validation of the SMOS mission for Space Weather operations: The potential of near real-time solar observation at 1.4 GHz

[M. Flores-Soriano](#), [C. Cid](#), [R. Crapolicchio](#)

Space Weather e2020SW002649 2021

<https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2020SW002649>

<https://doi.org/10.1029/2020SW002649>

Chapter 22 - The Effect of Solar Radio Bursts on GNSS Signals

Review

Xinan [Yue](#)*[WeixingWan](#)*[LimeiYan](#)*[WenjieSun](#)*[LianhuanHu](#)*[William S.Schreiner](#)†

In: [Extreme Events in Geospace](#) Origins, Predictability, and Consequences 2018, Pages 541-554

<http://sci-hub.tw/10.1016/B978-0-12-812700-1.00022-4>

Chapter 12 - Extreme Space Weather Events: A GOES Perspective

Review

William F. [Denig](#)*[DanielWilkinson](#)*†[Robert J.Redmon](#)*

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Frequency rising sub-THz emission from solar flare ribbons

E.P. [Kontar](#), [G.G. Motorina](#), [N.L.S. Jeffrey](#), [Y.T. Tsap](#), [G.D. Fleishman](#), [A.V. Stepanov](#)

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Are CMEs capable of producing Moreton waves? A case study: the 2006 December 6 event

G. [Krause](#); [M. Cécere](#); [E. Zurbriggen](#); [A. Costa](#); [C. Francile](#) ...

Monthly Notices of the Royal Astronomical Society, Volume 474, Issue 1, 11 February 2018, Pages 770–

778, <https://doi.org/10.1093/mnras/stx2817>

<https://academic.oup.com/mnras/article/474/1/770/4688933>

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[Koval](#), A., Y. Chen, A. Stanislavsky, and Q.-H. Zhang

(2017). J. Geophys. Res. Space Physics, 122 DOI: [10.1002/2017JA024080](https://doi.org/10.1002/2017JA024080)

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Solar Activity from 2006 to 2014 and Short-term Forecasts of Solar Proton Events Using the ESPERTA Model

T. [Alberti](#)¹, M. Laurenza², E. W. Cliver³, M. Storini², G. Consolini², and F. Lepreti

2017 ApJ 838 59 File

<http://sci-hub.cc/10.3847/1538-4357/aa5cb8>

Prediction and warning system of SEP events and solar flares for risk estimation in space launch operations

Alberto [García-Rigo](#)^{1*}, Marlon Núñez², Rami Qahwaji³, Omar Ashamari³, Piers Jiggins⁴, Gustau Pérez¹, Manuel Hernández-Pajares¹ and Alain Hilgers

J. Space Weather Space Clim., 6, A28 (2016)

<http://www.swsc-journal.org/articles/swsc/pdf/2016/01/swsc150014.pdf>

Solar Energetic Particle Events with Protons Above 500 MeV Between 1995 and 2015 Measured with SOHO/EPHIN

P. [Kühl](#), N. Dresing, B. Heber, A. Klassen

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Constraints on energy release in solar flares from RHESSI and GOES X-ray observations

I. Physical parameters and scalings

A. **Warmuth** and G. Mann

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Dynamic SEP event probability forecasts

S. W. **Kahler** and A. Ling

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Large-scale Globally Propagating Coronal Waves

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<http://solarphysics.livingreviews.org/Articles/lrsp-2015-3/> File

Measurements and Modeling of Total Solar Irradiance in X-Class Solar Flares

Christopher Samuel **Moore**, Phillip Clyde Chamberlin, Rachel Hock

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Hard X-ray Emission During Flares and Photospheric Field Changes

O. **Burtseva**, J. C. Martínez-Oliveros, G. J. D. Petrie, A. A. Pevtsov

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Solar science with the Atacama Large Millimeter/submillimeter Array - A revolutionizing new view of our Sun

Review

S. **Wedemeyer**, [T. Bastian](#), [R. Brajsa](#), [M. Barta](#), [H. Hudson](#), [G. Fleishman](#), [M. Loukitcheva](#), [B. Fleck](#), [E. P. Kontar](#), [B. De Pontieu](#), [S. K. Tiwari](#), [Y. Kato](#), [R. Soler](#), [P. Yagoubov](#), [J. H. Black](#), [P. Antolin](#), [E. Scullion](#), [S. K. Gun'ar](#), [N. Labrosse](#), [A. O. Benz](#), [H.-G. Ludwig](#), [P. Hauschildt](#), [J. G. Doyle](#), [V. M. Nakariakov](#), [S. K. Solanki](#), [S. M. White](#), [T. Ayres](#), [P. Heinzel](#), [M. Karlicky](#), [T. Van Doorselaere](#), [D. Gary](#), [C. E. Alissandrakis](#), [A. Nindos](#), [L. Rouppe van der Voort](#), [M. Shimojo](#), [T. Zaqarashvili](#), [E. Perez](#)

Space Sci. Rev. 2015

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Structure and Evolution of Magnetic Fields Associated with Solar Eruptions (Invited **Review**)

Haimin **Wang**, Chang Liu

Research in Astronomy and Astrophysics, 2015

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Эффект обратного тока в современных моделях солнечных вспышек: теория и высокоточные наблюдения

П. А. **Грицык**, Б. В. Сомов

Письма в Астрономический журнал, - 2014, #8, С. 554-565

Fitting FFT-derived Spectra: Theory, Tool, and Application to Solar Radio Spike Decomposition

Gelu M. **Nita**, Gregory D. Fleishman, Dale E. Gary, William Marin, Kristine Boone

ApJ, 2014

<http://arxiv.org/pdf/1406.2280v1.pdf>

Особенности субагерцового излучения солнечных вспышек

В.С. **Махмутов**, Г.А. Базилевская, Ю.И. Стожков, А.А. Квашнин

ИКИ-2014, Сессия: Солнце

<http://plasma2014.cosmos.ru/presentations>

Measurements and Modeling of Total Solar Irradiance in X-class Solar Flares

Christopher Samuel [Moore](#)^{1,2,3}, Phillip Clyde Chamberlin⁴, and Rachel Hock
2014 ApJ 787 32

Solar flares at submillimeter wavelengths **A review**

Sam [Krucker](#) · C.G. Gimenez de Castro · H.S. Hudson · G. Trottet · T.S. Bastian · A.S. Hales · J. Kašparova · K.-L. Klein · M. Kretzschmar · T. Luthi · A. Mackinnon · S. Pohjolainen · S.M. White
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[Yue X](#), Schreiner WS, Kuo YH, Zhao B, Wan W, Ren Z, Liu L, Wei Y, Lei J, Solomon S, Rocken C.
2013. J Geophys Res Space Phys 118: 5906–5918.
<http://dx.doi.org/10.1002/jgra.50525>
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Magnetic Flux Changes and Cancellation Associated with X-Class and M-Class Flares

Olga [Burtseva](#), Gordon Petrie
Solar Physics, April 2013, Volume 283, Issue 2, pp 429-452

H α Moreton waves observed on December 06, 2006 -- A 2D case study

C. [Francile](#)¹, A. Costa^{2,3,4}, M. L. Luoni⁴, 5 and S. Elaska
A&A 552, A3 (2013)

ABRUPT CHANGES OF THE PHOTOSPHERIC MAGNETIC FIELD IN ACTIVE REGIONS AND THE IMPULSIVE PHASE OF SOLAR FLARES

E. W. [Cliver](#)¹, G. J. D. Petrie², and A. G. Ling
2012 ApJ 756 144

THE SOLAR DECIMETRIC SPIKE BURST OF 2006 DECEMBER 6: POSSIBLE EVIDENCE FOR FIELD-ALIGNED POTENTIAL DROPS IN POST-ERUPTION LOOPS

E. W. [Cliver](#)^{1,2}, S. M. White^{1,3} and K. S. Balasubramaniam
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HIGH-RESOLUTION IMAGING OF SOLAR FLARE RIBBONS AND ITS IMPLICATION ON THE THICK-TARGET BEAM MODEL

Säm [Krucker](#)^{1,2}, H. S. Hudson^{1,3}, N. L. S. Jeffrey³, M. Battaglia³, E. P. Kontar³, A. O. Benz², A. Csillaghy² and R. P. Lin
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Brilliant Timing

Säm [Krucker](#) & Hugh Hudson
RHESSI Science Nuggets, Dec 2010
http://sprg.ssl.berkeley.edu/~tohban/wiki/index.php/Brilliant_Timing

RAPID ENHANCEMENT OF SHEARED EVERSHEDED FLOW ALONG THE NEUTRAL LINE ASSOCIATED WITH AN X6.5 FLARE OBSERVED BY HINODE

Na [Deng](#)^{1,2}, Chang Liu², Debi Prasad Choudhary¹ and Haimin Wang
2011 ApJ 733 L14

ABRUPT LONGITUDINAL MAGNETIC FIELD CHANGES IN FLARING ACTIVE REGIONS

G. J. D. [Petrie](#)¹ and J. J. Sudol²
Astrophysical Journal, 724:1218–1237, 2010

ON THE ORIGIN OF THE SOLAR MORETON WAVE OF 2006 DECEMBER 6

K. S. [Balasubramaniam](#)¹, E. W. Cliver², A. Pevtsov³, M. Temmer⁴, T. W. Henry³, H. S. Hudson⁵, S. Imada⁶, A. G. Ling⁷, R. L. Moore⁸, N. Muhr⁴, D. F. Neidig^{3,12}, G. J. D. Petrie⁹, A. M. Veronig⁴, B. Vršnak¹⁰, and S. M. White¹¹
Astrophysical Journal, 723:587–601, 2010, **File**

Large Amplitude Oscillations in Prominences

D. **Tripathi** · H. Isobe · R. Jain

2009; File (Fig. 4)

RAPID PULSATIONS IN SUB-THz SOLAR BURSTS

Pierre **Kaufmann**^{1,2}, C. Guillermo Gimenez de Castro¹, Emilia Correia^{1,3}, Joaquim E. R. Costa³, Jean-Pierre Raulin¹, and Adriana Silva Valio¹

Astrophysical Journal, 697:420–427, 2009

Sub-terahertz, Microwaves and High Energy Emissions During the 6 December 2006 Flare, at 18:40 UT

Pierre **Kaufmann** · Gérard Trottet · C. Guillermo Giménez de Castro · Jean-Pierre Raulin · Säm Krucker · Albert Y. Shih · Hugo Levato

Solar Phys (2009) 255: 131–142

Global Positioning System and solar radio burst forensics

Kintner, P. M.; O'Hanlon, B.; Gary, D. E.; Kintner, P. M. S.

Radio Science, Volume 44, Issue 2, CiteID RS0A08, 2009

FAILURE OF GPS FUNCTIONING CAUSED BY EXTREME SOLAR RADIO EVENTS

E. L. **Afraimovich**, V. V. Demyanov, D. E. Gary, A. B. Ishin, and G. Ya. Smolkov

BBSO Preprint #1361, 2008

<http://solar.njit.edu/preprints/afraimovich1361.pdf>

We investigate the performance quality of the Global Positioning System (GPS) during the **2006 December 6 and 2006 December 13** solar flares (soft X-ray class X6.5 and X3.4, respectively), which produced solar radio bursts with unprecedented radio flux density.

CAUSE AND EXTENT OF THE EXTREME RADIO FLUX DENSITY REACHED BY THE SOLAR FLARE OF 2006 DECEMBER 06

Dale E. **Gary**

BBSO Preprint #1360, 2008

<http://solar.njit.edu/preprints/gary1360.pdf>

The solar burst of **2006 December 06** reached a radio flux density of more than 1 million solar flux units ($1 \text{ sfu} = 10^{-22} \text{ W/m}^2/\text{Hz}$), as much as 10 times the previous record, and caused widespread loss of satellite tracking by GPS receivers. We discuss the differences among these three events, and consider the implications of these events for the upcoming solar cycle. **2006 December 13 and 14.**

"A last best active region" by Säm Krucker and Gordon Hurford

It can be found on <http://sprg.ssl.berkeley.edu/~tohban/nuggets/>

SPACE WEATHER, VOL. 5, S02002, doi:10.1029/2006SW000309, 2007

Solar flares leave astronauts scrambling

Irene Klotz

Abstract

Several late-cycle solar flares bursting from an oddly active sunspot hit the Earth's magnetosphere on 6 December 2006, sending NASA flight teams scrambling to make sure the space shuttle and International Space Station crews would safely weather the storms.

Presentation of Gilbert et al. (2007)

Followed by a Spectacular Forbush

SHINE campaign evens 5-14 December 2006

<http://shinecon.org/shine2008/talks/Campaign%20evens%205-14%20December%202006/>

See http://www.swpc.noaa.gov/sites/default/files/images/u33/Rutledge_SWW_2016.pdf

Evolution of Active Regions

Review

van Driel-Gesztelyi, Lidia and Green, Lucie M.

Living Reviews in Solar Physics PUB.NO. IrsP-2015-1, Sept 2015

<http://solarphysics.livingreviews.org/Articles/IrsP-2015-1/>

Study of the Forbush Decreases, Geomagnetic Storms, and Ground-Level Enhancements in Selected Intervals and Their Space Weather Implications

Badruddin & Anand Kumar

Solar Phys. 2015, File

Observations of flux rope formation prior to coronal mass ejections

L. M. Green, B. Kliem

Proc. IAU Symp. 300, 209, 2013

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Observations of flux rope formation prior to coronal mass ejections (invited), **Review**

Green, Lucie M., Kliem, Bernhard:

Nature of Prominences and Their Role in Space Weather, Proc. IAU Symp. 300, 209, 2014

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MAGNETIC HELICITY TRANSPORTED BY FLUX EMERGENCE AND SHUFFLING MOTIONS IN SOLAR ACTIVE REGION NOAA 10930

Y. Zhang^{1,2}, R. Kitai², and K. Takizawa

2012 ApJ 751 85

EVOLUTION OF CURRENTS OF OPPOSITE SIGNS IN THE FLARE-PRODUCTIVE SOLAR ACTIVE REGION NOAA 10930

B. Ravindra¹, P. Venkatakrisnan², Sanjiv Kumar Tiwari^{2,3} and R. Bhattacharyya

2011 ApJ 740 19

The Large SEP Events of December 2006

Cohen et al.

The December 2006 SEP Events: Unusual Signatures Within an ICME

Mulligan et al.

LOCAL TWIST AND CURRENT HELICITY DISTRIBUTIONS OF ACTIVE REGION NOAA 10930

J. T. Su^{1,2}, T. Sakurai¹, Y. Suematsu¹, M. Hagino¹, and Yu Liu³

Astrophysical Journal, 697:L103–L107, 2009 June 1 doi:[10.1088/0004-637X/697/2/L103](https://doi.org/10.1088/0004-637X/697/2/L103)

6-15 Dec

A correlation in the waiting-time distributions of solar flares

Hugh S. Hudson

MNRAS Volume 491, Issue 3, January 2020, Pages 4435–4441

<https://arxiv.org/pdf/1908.08749.pdf>

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Validation of the effect of cross-calibrated GOES solar proton effective energies on derived integral fluxes by comparison with STEREO observations

J. V. Rodriguez, I. Sandberg, R. A. Mewaldt, I. A. Daglis, P. Jiggins

Space Weather Volume 15, Issue 2 February 2017 Pages 290–309

<http://onlinelibrary.wiley.com/doi/10.1002/2016SW001533/full>

8 Dec

Superstrong photospheric magnetic fields in sunspot penumbrae

A. [Siu-Tapia](#), [A. Lagg](#), [M. van Noort](#), [M. Rempel](#), [S. K. Solanki](#)

A&A 2019

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Normal and counter Evershed flows in the photospheric penumbra of a sunspot. SPINOR 2D inversions of Hinode-SOT/ SP observations

A. [Siu-Tapia](#), [A. Lagg](#), [S. K. Solanki](#), [M. van Noort](#), [J. Jurčák](#)

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8-16 Dec

Expulsion of counter Evershed flows from sunspot penumbrae

[J.S. Castellanos Durán](#), [A. Korpi-Lagg](#), [S.K. Solanki](#)

ApJ 2023

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Observations of Photospheric Magnetic Structure below a Dark Filament using the Hinode Spectro-Polarimeter

Takaaki [Yokoyama](#), [Yukio Katsukawa](#), [Masumi Shimojo](#)

PASJ 2019

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9 Dec

Flare Observations

Review

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ON THE FLARE-INDUCED SEISMICITY IN THE ACTIVE REGION NOAA 10930 AND RELATED ENHANCEMENT OF GLOBAL WAVES IN THE SUN

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S. [Imada](#)¹, H. Hara², T. Watanabe², I. Murakami³, L. K. Harra⁴, T. Shimizu¹ and E. G. Zweibel
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Evidence of the radio-quiet hard X-ray precursor of the 13 December 2006 solar flare

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Solar Radio Spikes in 2.6 – 3.8 GHz during the 13 December 2006 Event

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A Comprehensive View of the 2006 December 13 CME: From the Sun to Interplanetary Space

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STUDY OF MAGNETIC CHANNEL STRUCTURE IN ACTIVE REGION 10930

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Astrophysical Journal, 687:658Y667, 2008

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ХАРАКТЕРИСТИКИ РЕЛЯТИВИСТСКИХ СКЛ В СОБЫТИИ 13 ДЕКАБРЯ 2006 г.

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STRONGLY BLUESHIFTED PHENOMENA OBSERVED WITH HINODE EIS IN THE 2006 DECEMBER 13 SOLAR FLARE

Ayumi **Asai**,^{1, 2,3} Hirohisa Hara,^{2,3} Tetsuya Watanabe,^{2,3} Shinsuke Imada,² Taro Sakao,⁴ Noriyuki Narukage,⁴ J. L. Culhane,⁵ and G. A. Doschek⁶

E-print, June 2008; Astrophysical Journal, 685:622-628, 2008

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Discovery of a Temperature-Dependent Upflow in the Plage Region during a Gradual Phase of the X-Class Flare

Shinsuke **IMADA**, Hirohisa HARA, Tetsuya WATANABE, and Suguru KAMIO, et al.

PASJ: Publ. Astron. Soc. Japan 59, S793–S799, 2007, **File**

We present **Hinode/EIS** raster scan observations of the plage region taken during the gradual phase of the GOES X3.2 flare that occurred on **2006 December 13**.

FAILURE OF GPS FUNCTIONING CAUSED BY EXTREME SOLAR RADIO EVENTS

E. L. **Afraimovich**, V. V. Demyanov, D. E. Gary, A. B. Ishin, and G. Ya. Smolkov

BBSO Preprint #1361, 2008

<http://solar.njit.edu/preprints/afraimovich1361.pdf>

We investigate the performance quality of the Global Positioning System (GPS) during the **2006 December 6** and **2006 December 13** solar flares (soft X-ray class X6.5 and X3.4, respectively), which produced solar radio bursts with unprecedented radio flux density.

CAUSE AND EXTENT OF THE EXTREME RADIO FLUX DENSITY REACHED BY THE SOLAR FLARE OF 2006 DECEMBER 06

Dale E. **Gary**

BBSO Preprint #1360, 2008

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The solar burst of **2006 December 06** reached a radio flux density of more than 1 million solar flux units ($1 \text{ sfu} = 10^{-22} \text{ W/m}^2/\text{Hz}$), as much as 10 times the previous record, and caused widespread loss of satellite tracking by GPS receivers. We discuss the differences among these three events, and consider the implications of these events for the upcoming solar cycle. **2006 December 13 and 14**.

Study of Magnetic Channel Structure in Active Region 10930

Haimin **Wang**, Ju Jing, Changyi Tan, Thomas Wiegelmann and Masahito Kubo

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Evolution of Evershed and Shear Flows Associated with the X3.4 Flare of 2006 December 13

Changyi **Tan**, P.F. Chen, Valentyna Abramenko and Haimin Wang

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Correlation Between Sharp Variation of the Transport Rate of Magnetic Helicity and Solar Eruptive Events (2.84 GHz)

Yin **Zhang**¹, Baolin Tan and Yihua Yan

E-print, June 2008

Observable Parameters of Solar Microwave Pulsating Structure and Their Implications for Solar Flare

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E-print, June 2008.

3D MAGNETIC FIELD CONFIGURATION OF THE 2006 DECEMBER 13 FLARE EXTRAPOLATED WITH THE OPTIMIZATION METHOD

Y. **Guo**, M. D. Ding, T. Wiegelmann, and H. Li

The Astrophysical Journal, 679:1629Y1635, 2008

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A Comprehensive View of the 13 December 2006 CME:

From the Sun to Interplanetary Space

Y. Liu^{1,2}, J. G. Luhmann¹, P. C. Schroeder¹, L. Wang¹, Y. Li¹, R. P. Lin¹, S. D. Bale¹, R. M. E. Müller-Mellin³, M. H. Acuña⁴, and J.-A. Sauvaud⁵

E-print, April 2008; ApJ

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Intermittency in the Photosphere and Corona Above an Active Region

Valentyna Abramenko, Vasyl Yurchyshyn and Haimin Wang

BBSO, #1359, 2008

Microwave and Hard X-Ray Spectral Evolution for the 13 December 2006 Solar Flare

Zongjun Ning

Solar Phys (2008) 247: 53–62

<http://www.springerlink.com/content/ew0324n62152062u/fulltext.pdf>

Non-linear force-free field modeling of a solar active region around the time of a major flare and coronal mass ejection

C.J. Schrijver¹, M.L. DeRosa¹, T. Metcalf², G. Barnes², B. Lites³, T. Tarbell¹, J. McTiernan⁴, G. Valori⁵, T. Wiegmann⁶, M.S. Wheatland⁷, T. Amari⁸, G. Aulanier⁹, P. D'émoulin⁹, M. Fuhrmann¹⁰, K. Kusano¹¹, S. R'egnier¹², J.K. Thalmann⁶

E-print, Nov 2007, ApJ Vol. 675, No. 2: 1637-1644, 2008.

<http://www.journals.uchicago.edu/doi/pdf/10.1086/527413>

Solar flares and coronal mass ejections are associated with rapid changes in field connectivity and powered by the partial dissipation of electrical currents in the solar atmosphere. A critical unanswered question is whether the currents involved are induced by the motion of pre-existing atmospheric magnetic flux subject to surface plasma flows, or whether these currents are associated with the emergence of flux from within the solar convective zone. We address this problem by applying state-of-the-art nonlinear force-free field (NLFFF) modeling to the highest resolution and quality vector-magnetographic data observed by the recently launched Hinode satellite on NOAA Active Region 10930 around the time of a powerful X3.4 flare. We compute 14 NLFFF models with 4 different codes and a variety of boundary conditions. We find that the model fields differ markedly in geometry, energy content, and force-freeness. We discuss the relative merits of these models in a general critique of present abilities to model.

Initial Observations of Sunspot Oscillations Excited by Solar Flare

A. G. Kosovichev, T. Sekii

E-print, Oct 2007; Ap. J. http://arxiv.org/PS_cache/arxiv/pdf/0710/0710.1808v1.pdf

Observations of a large solar flare of December 13, 2006, using Solar Optical Telescope (SOT) on Hinode spacecraft revealed high-frequency oscillations excited by the flare in the sunspot chromosphere. These oscillations are observed in the region of strong magnetic field of the sunspot umbra, and may provide a new diagnostic tool for probing the structure of sunspots and understanding physical processes in solar flares.

Diagnostics of Radio Fine Structures around 3 GHz with Hinode Data in the Impulsive Phase of an X3.4/4B Flare Event on 2006 December 13

Yihua Yan, Jing huang¹ Bin chen¹ and Takashi sakurai²

E-print, Oct 2007, PASJ

Interaction between a Fast Rotating Sunspot and Ephemeral Regions as the Origin of the Major Solar Event on 2006 December 13

Evolution of the Sheared Magnetic Fields of two X-class Flares Observed by Hinode/XRT

Yingna **Su**, Leon Golub, Adriaan Van Ballegooijen, Edward Deluca, Kathy Reeves, Taro Sakao, Ryohei Kano, Noriyuki Narukage, and Kiyoto Shibasaki
E-print, August 2007

The Microwave Pulsations and the Tearing modes in the Current-Carrying Flare Loops

Baolin **Tan**, Yihua Yan, Chengming Tan, and Yuying Liu
E-print, August 2007
X3.4 Flare/CME event on **December 13, 2006**

Particle Acceleration in the X3 Event on Dec. 13, 2007

[Shibasaki, Kiyoto; Koshiishi, H.; Shimojo, M.; Minoshima, T.; Imada, S.; Sakao, T.; Hinode team](#)

American Astronomical Society Meeting 210, #94.35

Publication Date: 05/2007

Abstract

Spatial Distribution of Magnetic Reconnection in the 2006 December 13 Solar Flare As Observed by Hinode

Ju **Jing**^{1;2}, Jongchul Chae³, and Haimin Wang^{1;2}

Preprint BBSO #1352, 2007, File; The Astrophysical Journal Letters, Vol. 672, No. 1: L73-L76.

<http://www.journals.uchicago.edu/doi/abs/10.1086/526339>

A massive two-ribbon flare and its source magnetic field region were well captured by the Solar Optical Telescope (SOT) on board *Hinode* in the Ca II H spectral line and by the Spectro-Polarimeter of SOT, respectively. Using the high-resolution *Hinode* data sets, we compare the spatial distribution of the local magnetic reconnection rate and the energy release rate along the ribbons with that of G-band kernels that serve as a proxy for the primary energy release. The G-band kernels spatially coincide with the maximum of both modeled quantities, which gives strong support for the reconnection model. We also investigate the magnitude scaling correlation between the ribbon separation speed V_r and magnetic field strength B_n at four 2 minute time bins around the maximum phase of the flare. It is found that V_r is weakly and negatively correlated with B_n . An empirical relation of $V_r \propto B_n^{-0.15}$ is obtained at the flare peak time with an correlation coefficient ~ -0.33 . The correlation is weaker at other time bins.

Changes of Magnetic Structure in 3-D Associated with the X3.4 Flare of 2006 December 13

Ju **Jing**^{1;2}, Thomas Wiegelmann³, Yoshinori Suematsu⁴, Masahito Kubo⁵, and Haimin Wang

Preprint BBSO#1354, 2007, The Astrophysical Journal, 676: L81-L84, **2008** March 20

<http://www.journals.uchicago.edu/doi/pdf/10.1086/587058>

Recent observations demonstrated that sunspot structure can change rapidly and irreversibly after ares. One of the most puzzling results is the increase in magnetic shear around aring magnetic polarity inversion line (PIL) after ares. However, all these observations were made at 2-dimensional (2-D) photosphere. In this letter, we study the altitude variation of the non-potentiality of the magnetic fields associated with the 4B/X3.4 are of 2006 December 13. The vector magnetograms with unprecedented quality from *Hinode* before and after the are are used as the boundary conditions to extrapolate the 3-dimensional (3-D) non-linear force-free (NLFF) magnetic fields and the potential fields. The former are computed with the optimization algorithm and the later with Green's function method. At the photosphere boundary, magnetic shear increases after the are in a local area close to the aring magnetic PIL. Two measures of the magnetic non-potentiality, the weighted mean shear $_w$ and the total magnetic shear $_wB$, are calculated in this area at progressively higher altitude. By comparing their altitude variation $_les$ before and after the are, we find that the non-potentiality of the local area increases after the are below 8,000 km and decreases from that height to $_70,000$ km. Beyond 70,000 km, the magnetic fields approach potential for both times.

13-14 Dec

Extreme solar events

[Edward W. Cliver](#), [Carolus J. Schrijver](#), [Kazunari Shibata](#) & [Ilya G. Usoskin](#)

[Living Reviews in Solar Physics](#) volume 19, Article number: 2 (2022)

<https://link.springer.com/content/pdf/10.1007/s41116-022-00033-8.pdf>

Review

Onset mechanism of solar eruptions

Satoshi [Inoue](#) [Yumi BambacKanya Kusanob](#)

[Journal of Atmospheric and Solar-Terrestrial Physics Volume 180](#), November 2018, Pages 3-8
[sci-hub.tw/10.1016/j.jastp.2017.08.035](https://doi.org/10.1016/j.jastp.2017.08.035)

Large SEP events of 2012: proton onset and source function

Alexei [Struminsky](#)

2013 J. Phys.: Conf. Ser. 409 012148

14 Dec - 22:15 UT: x1.5 west flare

The Sun and Space Weather

Review

[Nat Gopalswamy](#)

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