



Space Weather products (models & observations) relevant to launch

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Storms and Effects

Radiation Storms

Energetic ions

- Radiation hazards to humans
- SEEs on spacecraft components and electronics
- PCA on radio waves
- Event total dose

Energetic electrons

Internal charging of electronics

Geomagnetic Storms Ionospheric Storms

Large/rapid variations/
disturbances in space and
time (in fields and plasma/
neutral distribution)
Enhancement in currents

Affect

- Communication
- Navigation
- Surface charging
- Radio wave propagation

Radio Blackouts due to flares

Radio emissions/noise
associated with flares
(direct impacts)

X-ray/EUV emission
altering ionospheric
structure/
composition (indirect)

Radio wave
blackouts
(dayside
ionosphere)



Major SWx Concerns for Launch



- Solar energetic particle event
 - On the ground: >100 MeV proton flux
 - Outside Earth's protection: >30 MeV proton flux
- Geomagnetic Storms
 - $K_p \geq 7$
- Other mission specific concerns



SEP events



- Suggested constraint
 - >100 MeV flux exceeds 1pfu



SWx products



- Relevant to SEPs and geomagnetic storms
- Layout
 - <http://go.nasa.gov/1PUZOyK>
 - http://bit.ly/products_launch_relevant



iSWA layouts

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layouts



- Monitoring space weather activities
- Events
- Anomaly
- Comparative study
- Weekly summary and highlights of specifics



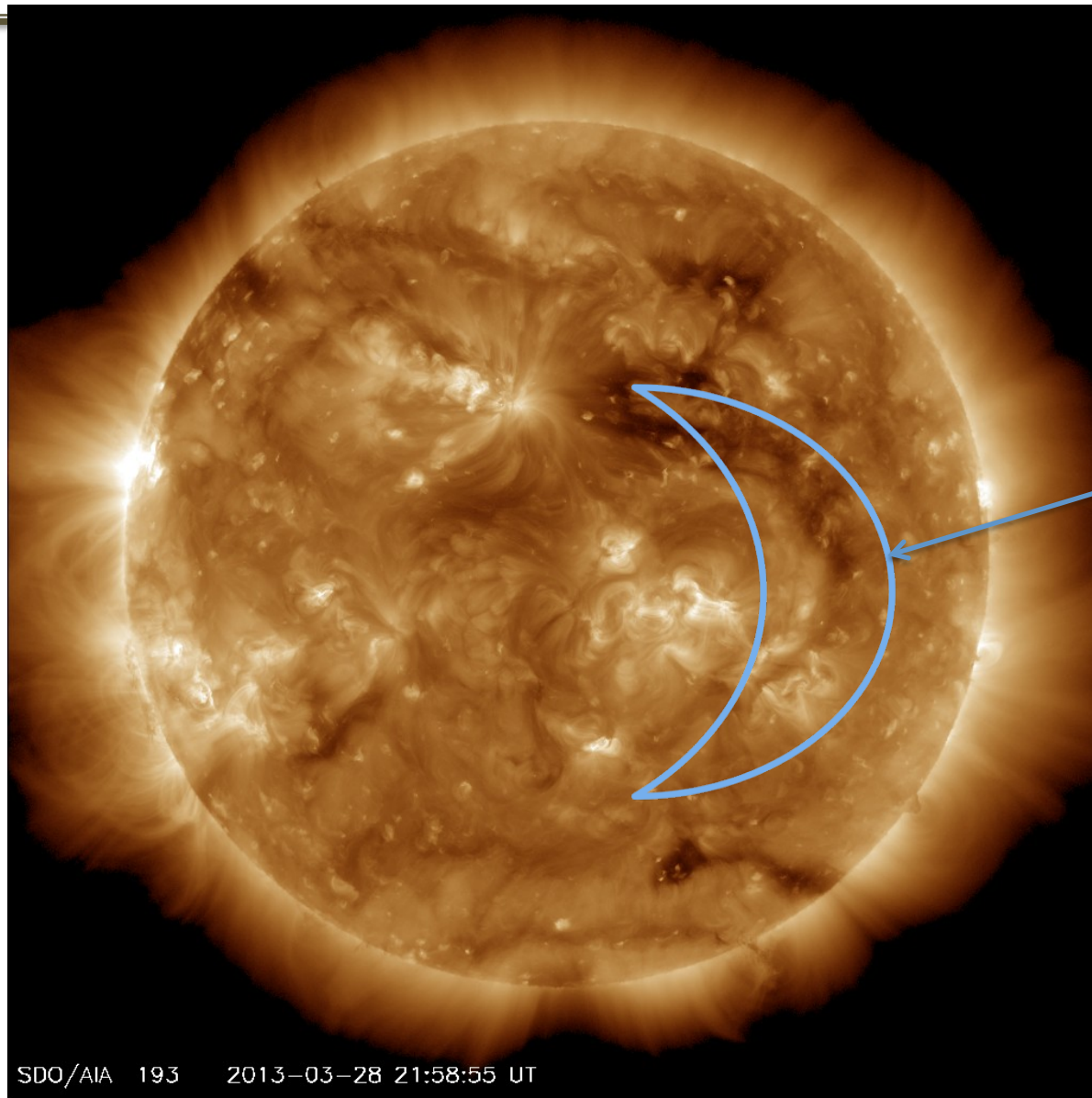
Layouts - examples



- <http://1.usa.gov/1rQXhWK> - x1.4 flare on April 25, 2014
- <http://1.usa.gov/1kr0842> - summary 20140430
- <http://1.usa.gov/1i2Qemt> scintillation with Kp
- <http://1.usa.gov/1gPzEKM> scintillation
- <http://1.usa.gov/1deGdXC> anomaly resolution
- <http://1.usa.gov/1fk5Fv6> coronal hole responsible for Saturn aurora



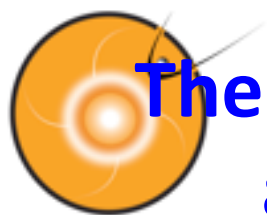
The Coronal Hole possibly responsible for the aurora at Saturn around May 20, 2013



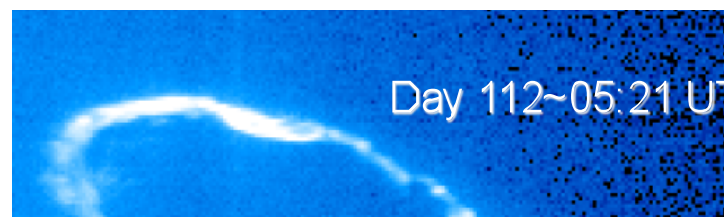
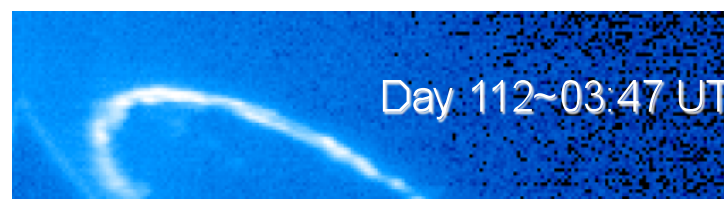
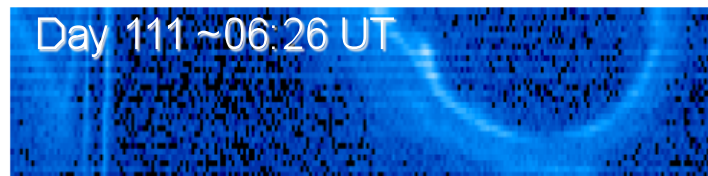
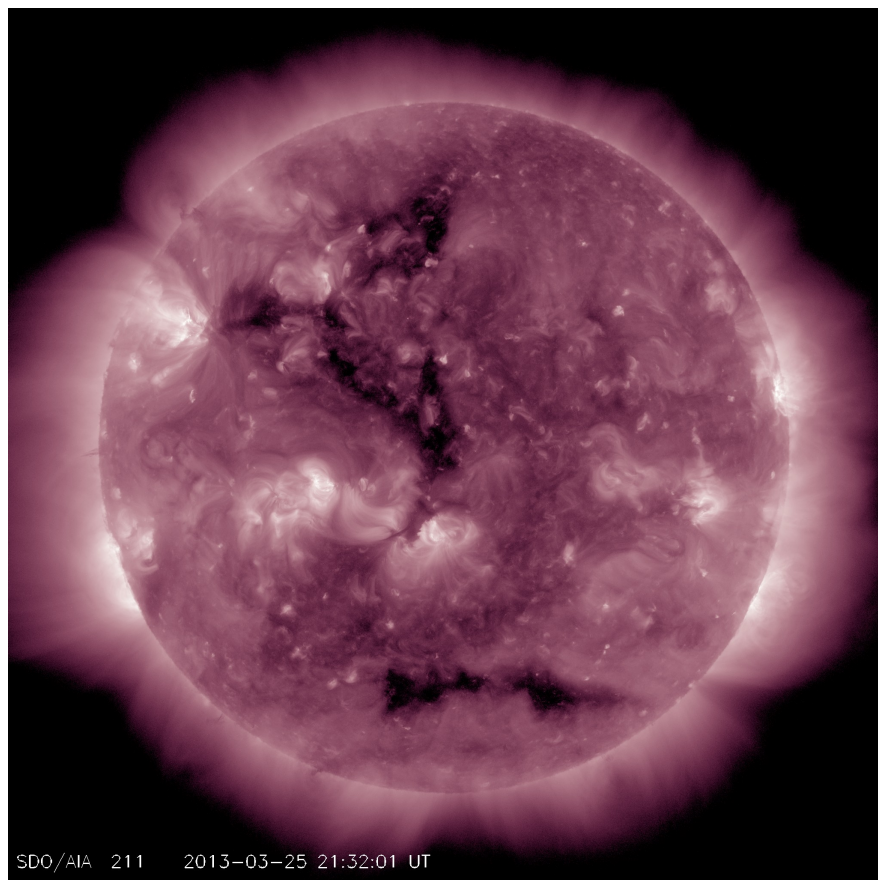
Coronal Hole

Well, I tried ☺

SDO/AIA 193 2013-03-28 21:58:55 UT



The Coronal Hole possibly responsible for the aurora at Saturn around May 20, 2013





Layouts - examples



- <http://1.usa.gov/1e5ZBDW> - march 7, 2012 event
- <http://1.usa.gov/LSfnaC> - evolution of March 2013 coronal hole in SDO, STA and STB
- <http://1.usa.gov/1lZjWeD> - SDO view of the coronal hole when it arrived at ACE
- <http://1.usa.gov/1c51aIC> - layout of the 2013-09-29 CME and its impacts
- <http://1.usa.gov/HUue2U> - summary_20131113
- <http://1.usa.gov/172TYTB> - 20131107 CME highlight



Other layouts



- <http://swrc.gsfc.nasa.gov/main/demo>