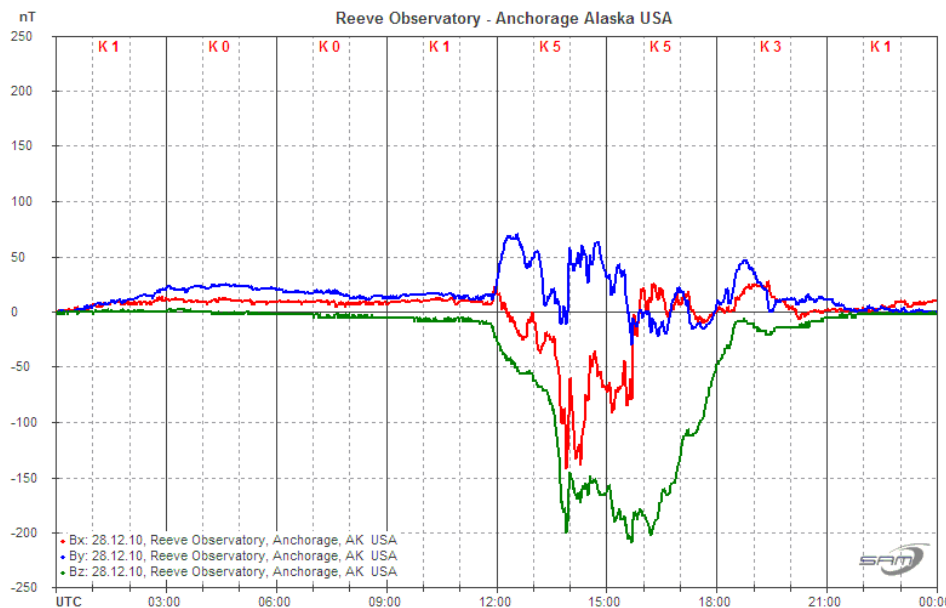


Geomagnetic Disturbance Report – Reeve Observatory

Event Type: Coronal mass ejection

Background: A coronal mass ejection (CME) is a strong surge in the emission of charged particles with a resulting increase in the velocity and density of the solar wind. A CME must be directed at Earth for it to disturb the geomagnetic field. When the surge hits the Earth's magnetosphere, usually 3 – 5 days after the solar event, the magnetic field is disturbed and oscillates. This in turn generates electric currents in the Earth's ionosphere and near-Earth space environment. The electric currents in turn generate additional magnetic-field variations.

Activity: On 28 December 2010, five days after it occurred, a CME intercepted the Earth's magnetosphere at 1200 UTC. The disturbance subsided by 2200 UTC the same day for a duration of 10 h.



The event was reported by the Space Weather Prediction Center:

“IIA. Geophysical Activity Summary 27/2100Z to 28/2100Z: The geomagnetic field ranged from quiet to minor storm levels during the period. At approximately 28/0930Z, effects from the 23 December CME impacted Earth's magnetic field. Observations from the ACE spacecraft indicated a sharp decrease in the Bz component of the IMF (-13nT at 28/1401Z) while the Bt component reached a maximum value of 14nT at 28/1315Z. The field responded with an isolated minor storm period from 28/1200 - 1500Z at all latitudes. Thereafter, storm conditions diminished to unsettled to active levels through the end of the summary period.”

Geomagnetic Disturbance Report – Reeve Observatory

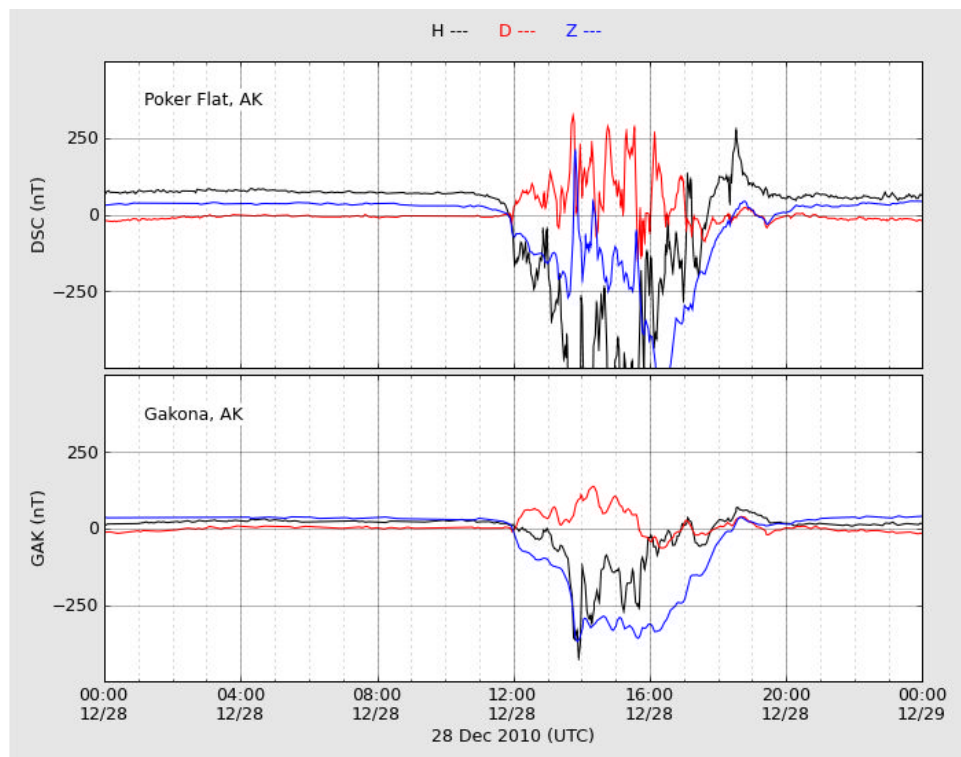
SWPC also issued the following Alerts on 28 December:

“Space Weather Message Code: ALTK04
Serial Number: 1490
Issue Time: 2010 Dec 28 1340 UTC
ALERT: Geomagnetic K-index of 4
Threshold Reached: 2010 Dec 28 1337 UTC
Synoptic Period: 1200-1500 UTC
Station: Boulder
Active Warning: Yes”

“Space Weather Message Code: ALTK05
Serial Number: 649
Issue Time: 2010 Dec 28 1356 UTC
ALERT: Geomagnetic K-index of 5
Threshold Reached: 2010 Dec 28 1356 UTC
Synoptic Period: 1200-1500 UTC
Station: Boulder
Active Warning: Yes
NOAA Scale: G1 - Minor”

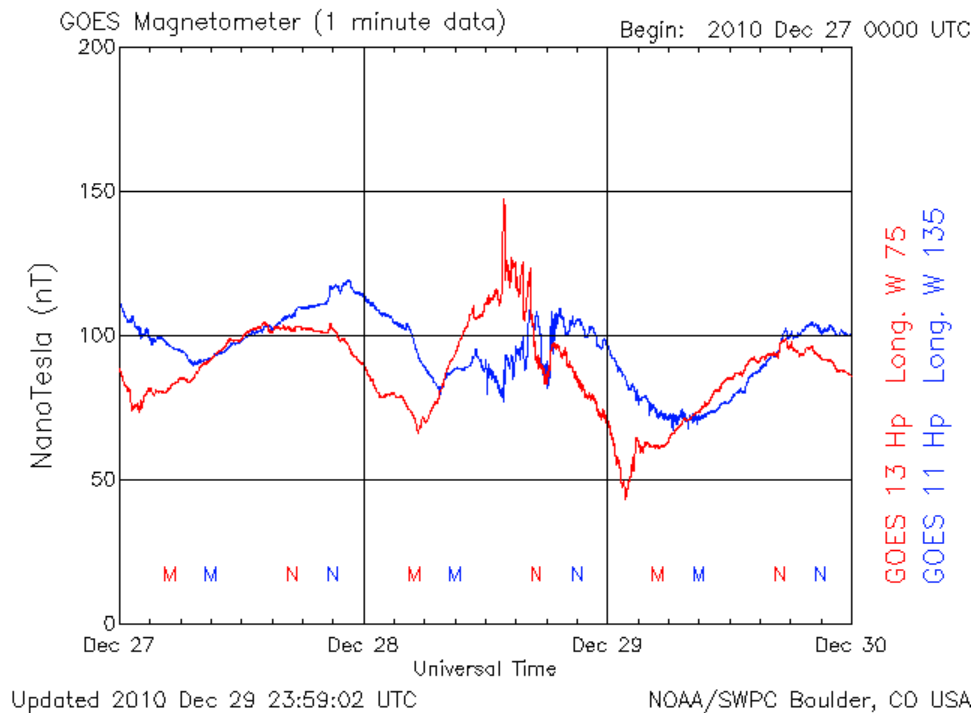
Supporting data: Magnetograms from the Alaska Magnetometer Chain, Poker Flat and Gakona Stations, and GOES are provided below.

Alaska Magnetometer Chain, Poker Flat and Gakona Stations:



Geomagnetic Disturbance Report – Reeve Observatory

GOES:



Equipment:

Simple Aurora Monitor (SAM-III) located at geomagnetic coordinates: 61.63 °N : 262.89 °E
Equipment description: www.reeve.com/SAMDescription.htm

Resources:

Reeve Observatory SAM-III real-time data: www.reeve.com/SAM/SAM_simple.html
Alaska Magnetometer Chain – 137.229.36.30/cgi-bin/magnetometer/magchain.cgi
Geostationary Operational Environmental Satellites – www.swpc.noaa.gov/rt_plots/mag_3d.html
Space Weather Prediction Center – www.swpc.noaa.gov/
SOHO – http://sohodata.nascom.nasa.gov/cgi-bin/data_query
SDO – <http://sdo.gsfc.nasa.gov/>

Tutorial:

www.reeve.com/Documents/SAM/GeomagnetismTutorial.pdf