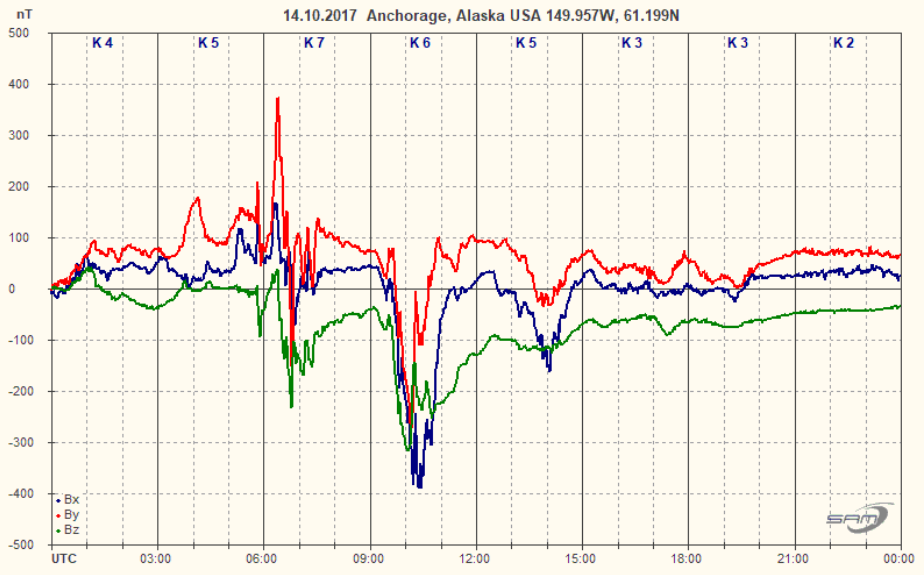
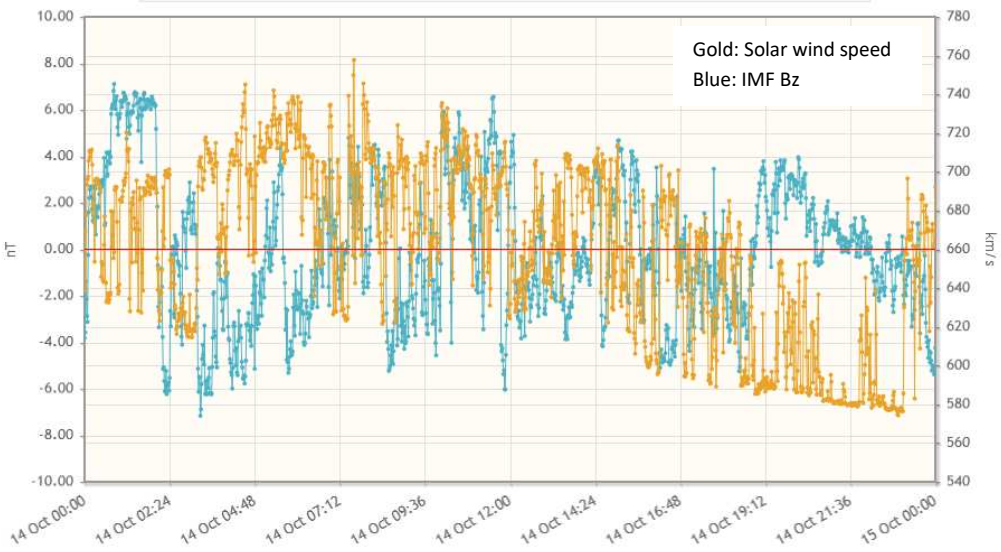
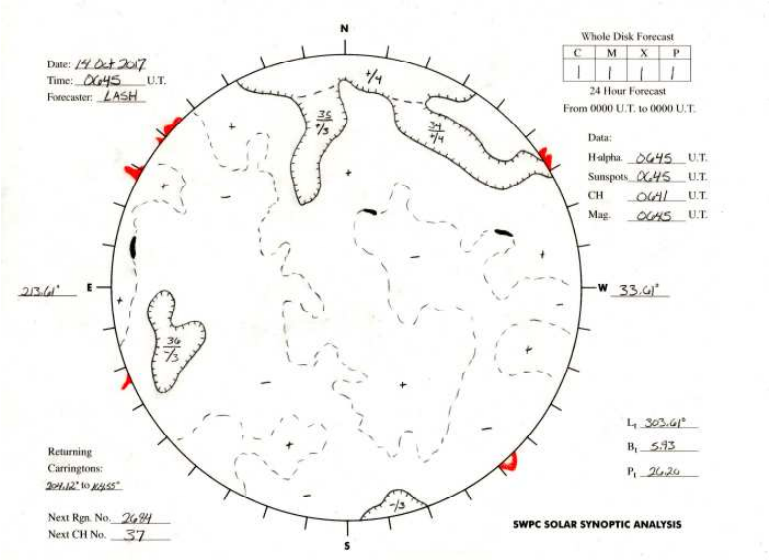
Observations of Geomagnetic Storm Conditions at Anchorage, Alaska on 14 October 2017
Whitham D. Reeve

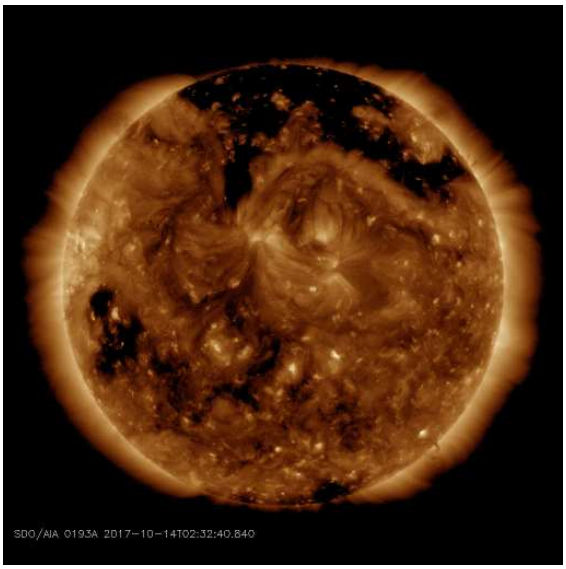


Above: 24 hour magnetogram at Anchorage, Alaska for 14 October 2017. Storm conditions (K ≥ 5) are indicated during the four synoptic periods beginning 0300, 0600, 0900, and 1200. These conditions likely were caused by the combination of two phenomena: (1) The Bz component of the interplanetary magnetic field (IMF) reached –7 nT, which enabled reconnection with Earth's field; and (2) The solar wind speed was elevated throughout the 24 h period due to a geoeffective polar-connected coronal hole. Instrumentation for this magnetogram: SAM-III with 0.1 Hz sample rate. Source [1]

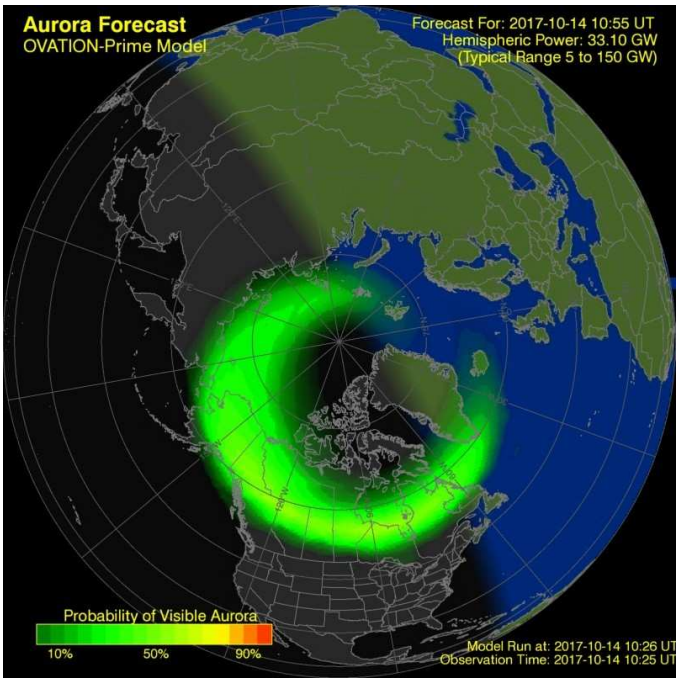


Above: 24 hour plot of solar wind speed (gold trace and right scale) and IMF Bz component (blue trace and left scale) based on 1 minute averages from DSCOVR spacecraft for 14 October. DSCOVR is located 1.5 million km from Earth in line with the Sun. The solar wind speed, which reached about 760 km s^{-1}, is considerably elevated above the quiet Sun wind speed of 300 to 400 km/s. Bz varies from approximately +7 to –7 nT throughout the day. The negative excursions enable reconnection of the IMF with Earth's field and stormy geomagnetic conditions as noted in the previous magnetogram. There is no obvious correspondence in time because of delays associated with IMF energy dumping and conversion into disturbances in the geomagnetic field. Source [2]





Above: Solar Synoptic Map (left) at 0645 UTC and 193 Å image (right) at 1632 UTC 14 October. A positive polarity, polar-connected coronal hole is shown at top of the synoptic map by lines with hash marks on the coronal hole side of the boundary. The coronal hole shows as the dark area at the top of the corresponding image. It is the likely source of the elevated wind and contributed to the magnetic storm conditions at Earth. Source [3]



Left: Forecasted position of the auroral oval for 1030 on 14 October corresponds to the negative peak on the Anchorage magnetogram. The oval is approximately centered on the geomagnetic north pole and expands with stormy geomagnetic conditions. In this event, it almost reached the US-Canadian border. For reference, the local Anchorage midnight was approximately 0945 UTC. Note the disappearance of part of the oval around midday on the sunlit side. Source [3]

Image and data sources: [1] Reeve Observatory; [2] STAFF viewer, http://www.staff.oma.be; [3] NOAA, Space Weather Prediction Center, NASA