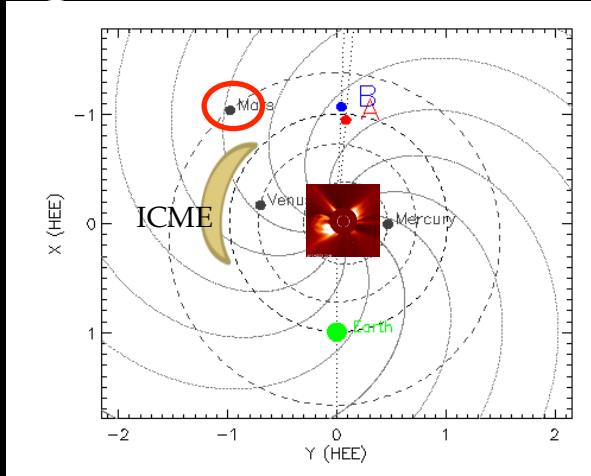


Martian Magnetic Storms

Illustration showing the geometry of the MAVEN ICME event (SOHO LASCO C2 CME image; STEREO Science Center plot in background).

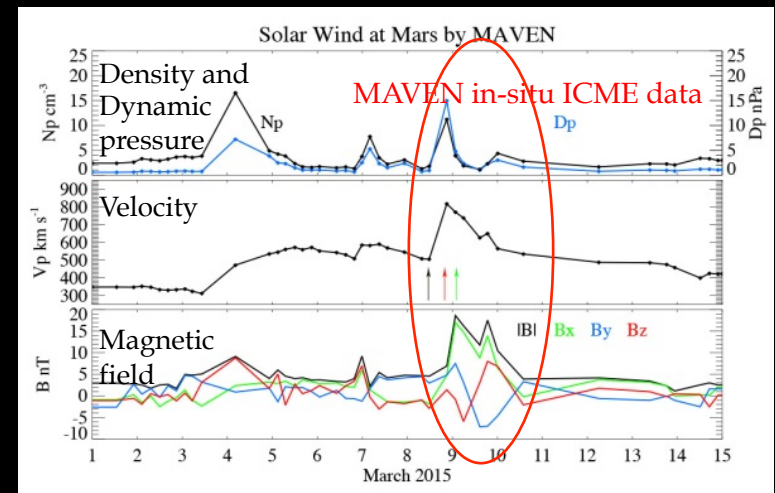


-> Interplanetary Coronal Mass Ejections (ICMEs) are known to be responsible for major geomagnetic storms.

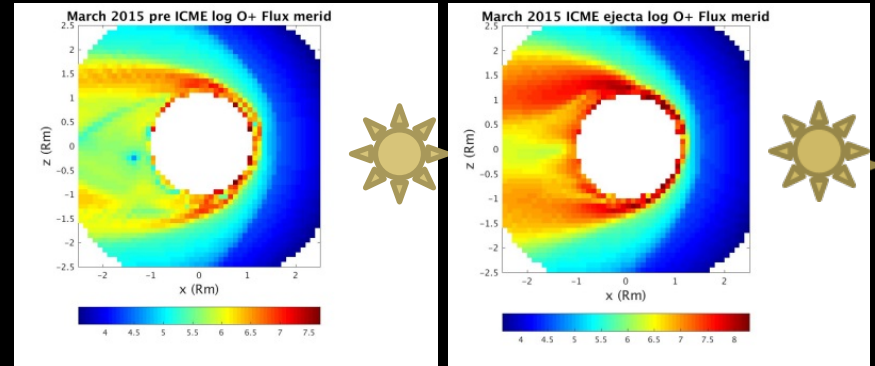
-> MAVEN observed an ICME impacting Mars in March 2015 (upper right)[#]. Its in-situ plasma and magnetic field observations were well-described by MHD simulations* of the Mars-solar wind interaction.

-> These allow us to infer global magnetic field and ionospheric responses accompanying increased ion escape (right), giving insight into the nature of geomagnetic storm counterparts at Mars.**

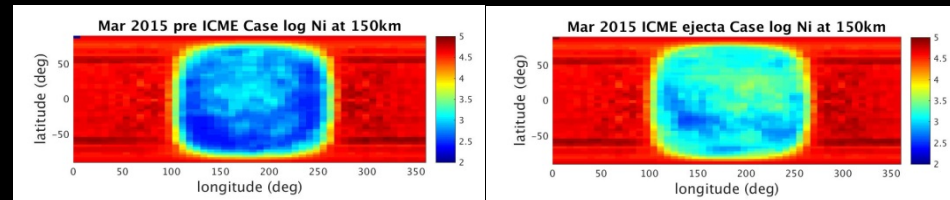
-> They also provide an inkling of ground magnetic field signatures of space weather that the Insight lander may observe when it arrives in 2019.



Meridian contours: atmospheric ion flux Before (below L) and during ICME passage (R)



Model Maps (solar longitude and latitude coordinates, Midnight at 180 deg. longitude). Ionospheric density N_i at 150 km Before (L) and during (R) ICME passage



[#] Jakosky et al., Science, 2015. * BATS-R-US (e.g. Ma et al., Dong et al., Curry et al., 2015) ** Luhmann et al., JGR, 2017.