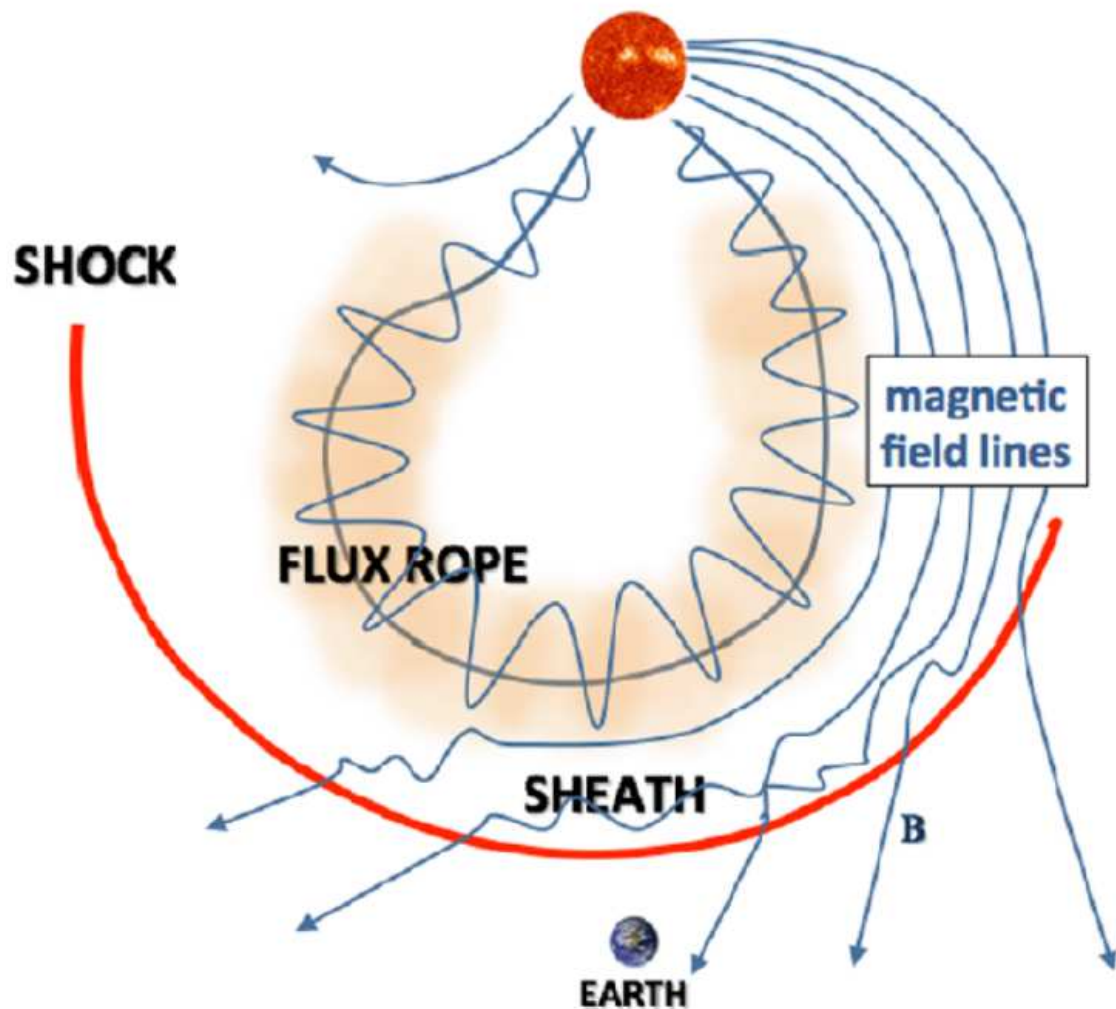


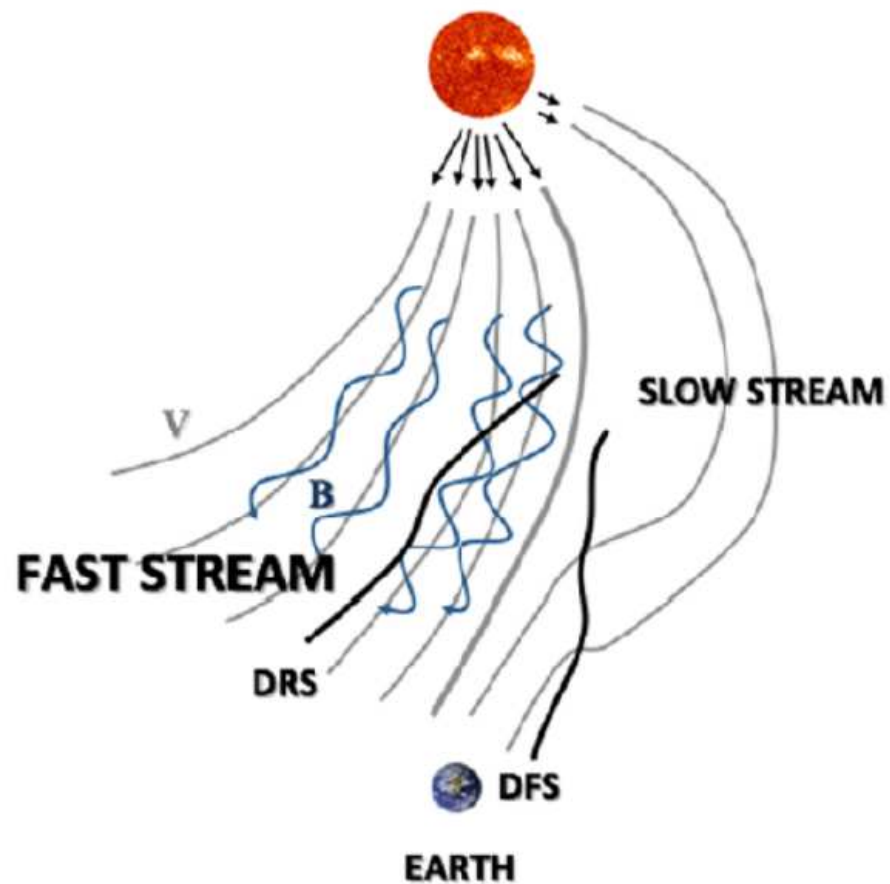
High Speed Stream (HSS)

Interplanetary Coronal Mass Ejection



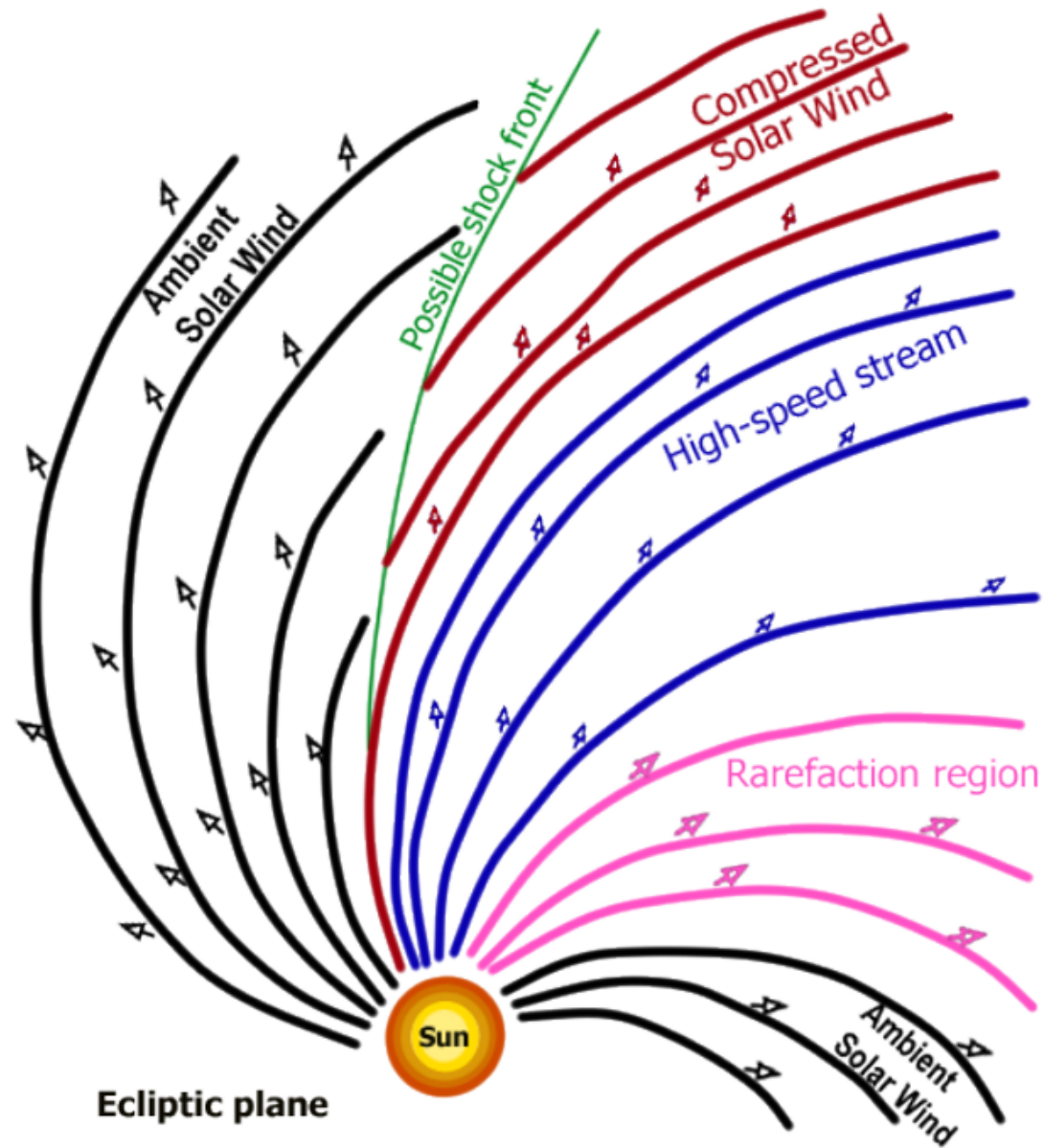
CME ← ICME

Stream Interaction Region

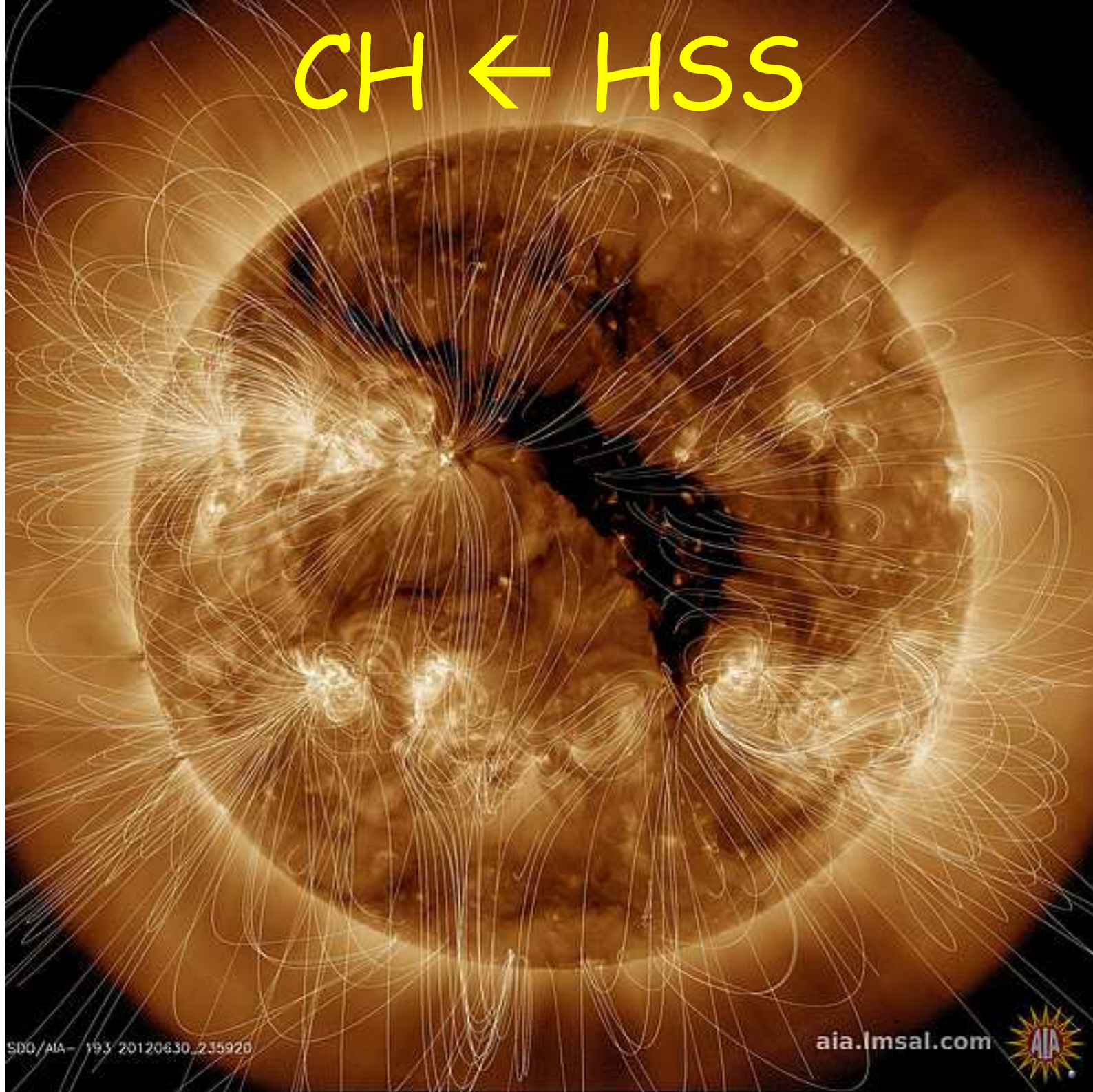


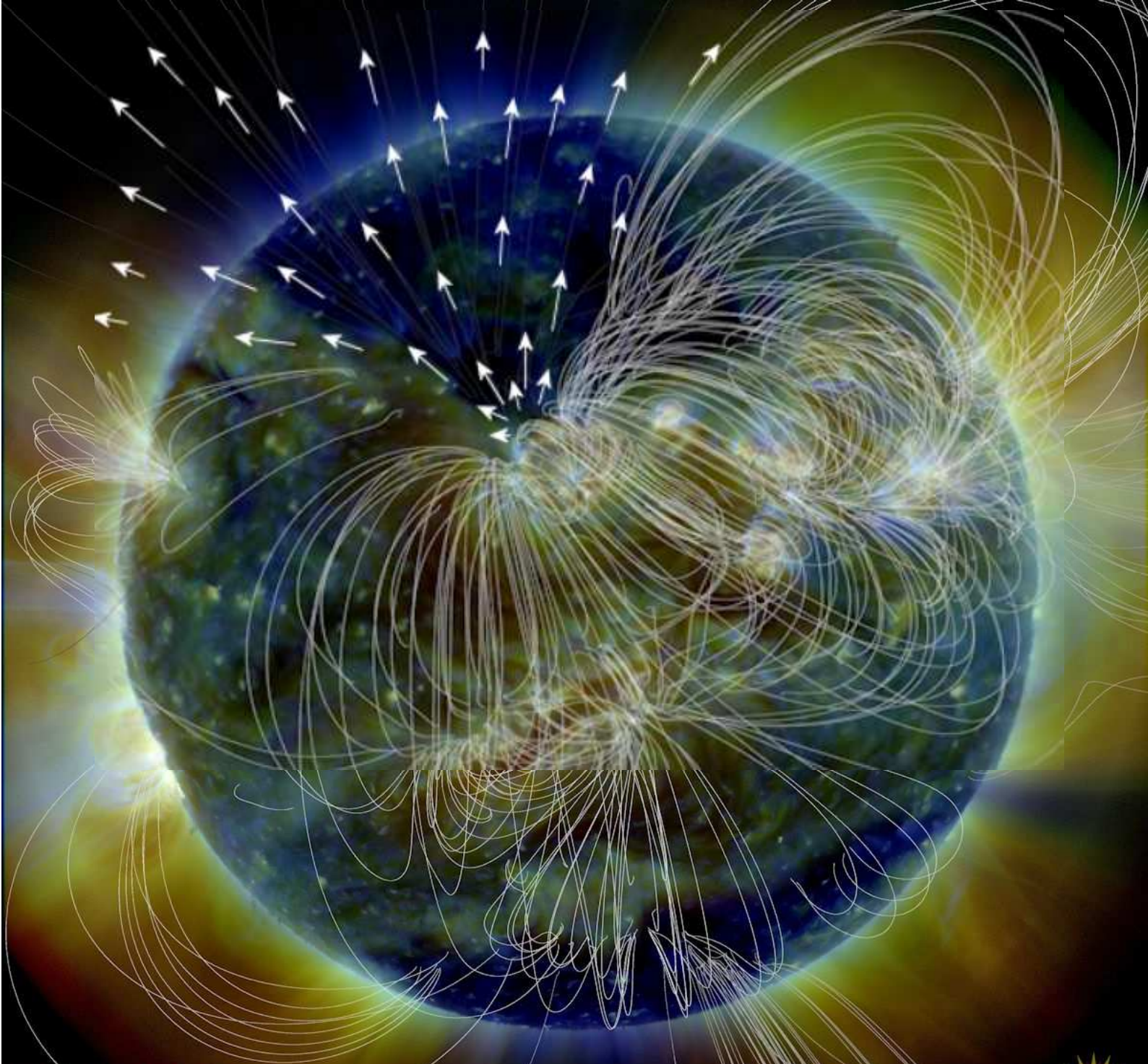
CH ← SIR/CIR

Stream/Corotating Interaction Region (SIR/CIR)



CH ← HSS



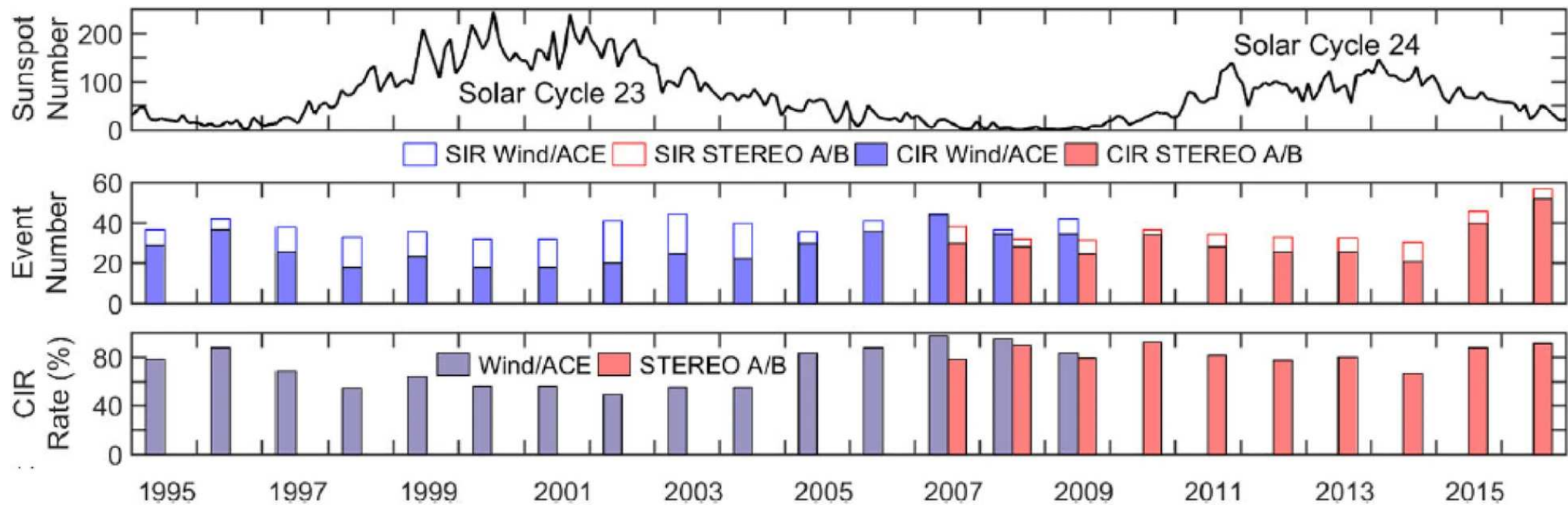


SDO/AIA- 211 20160220_171700
SDO/AIA- 193 20160220_171706
SDO/AIA- 171 20160220_171711

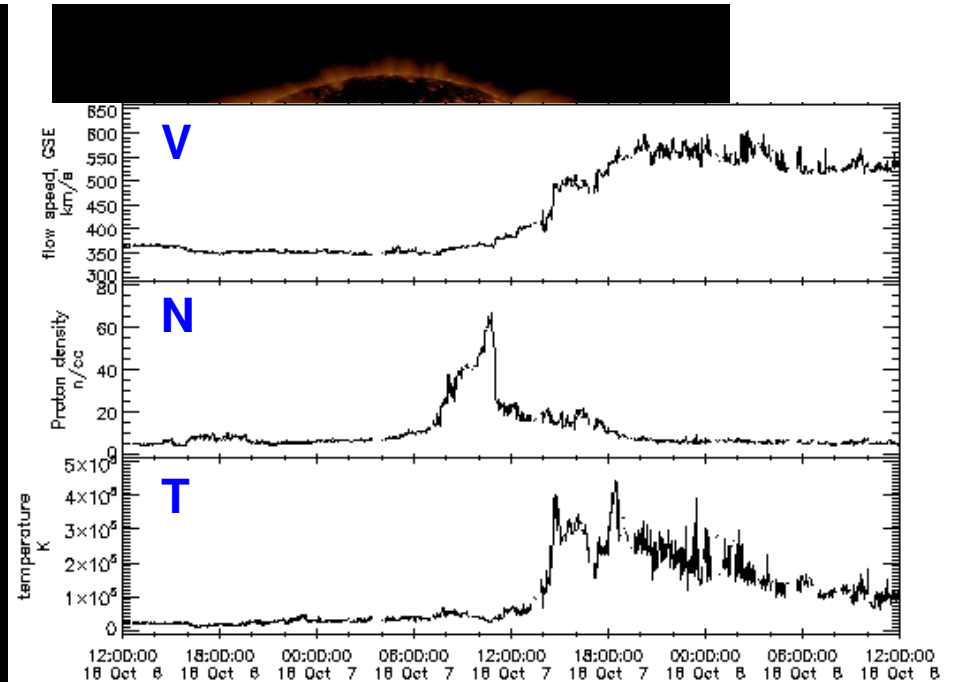
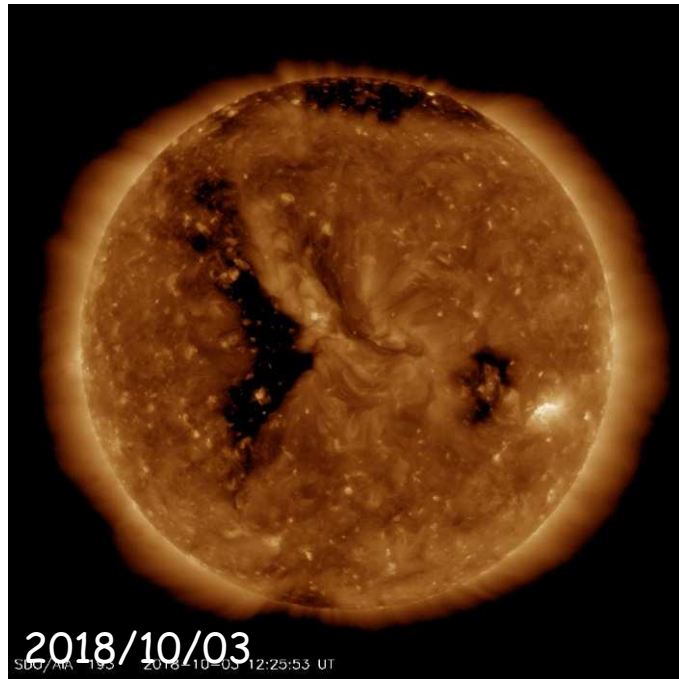
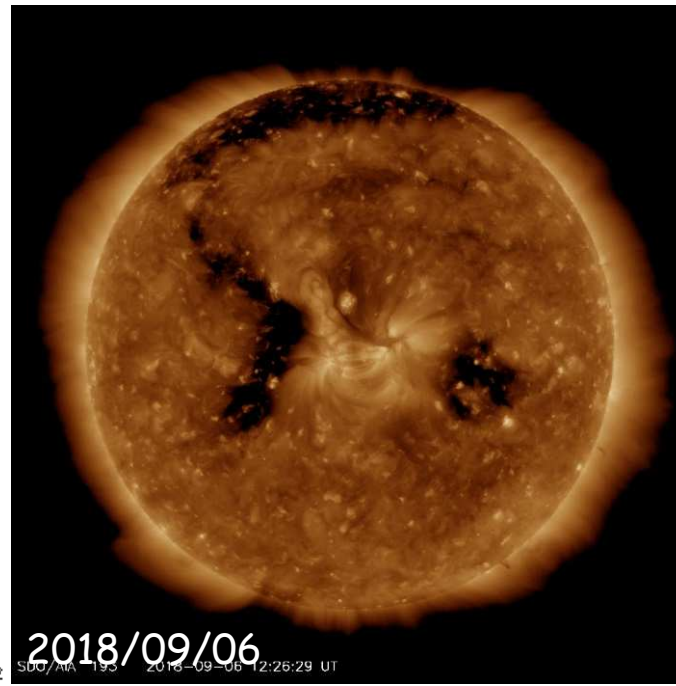
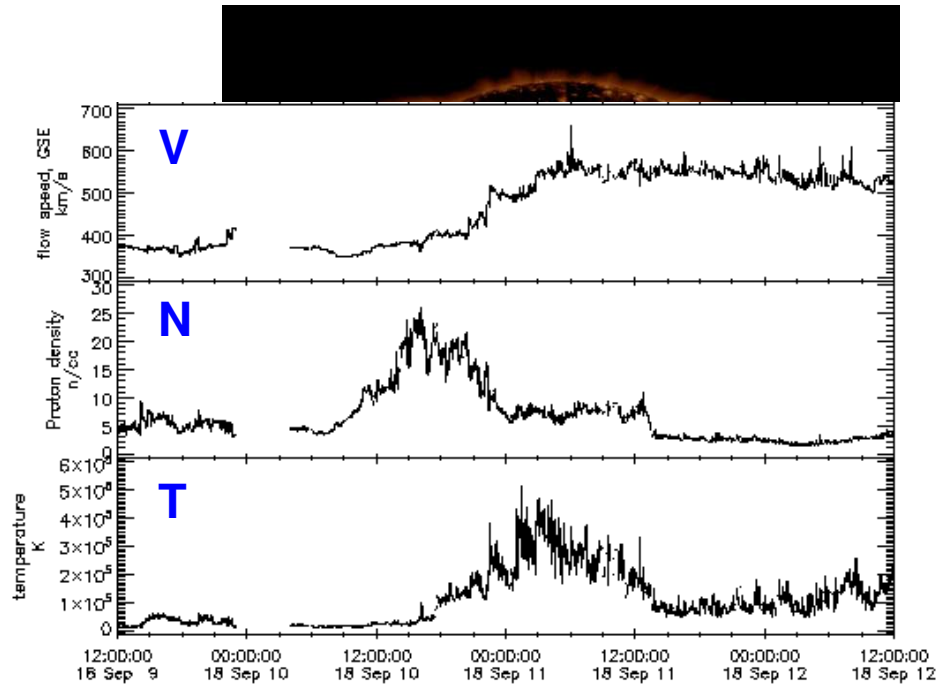
aia.lmsal.com



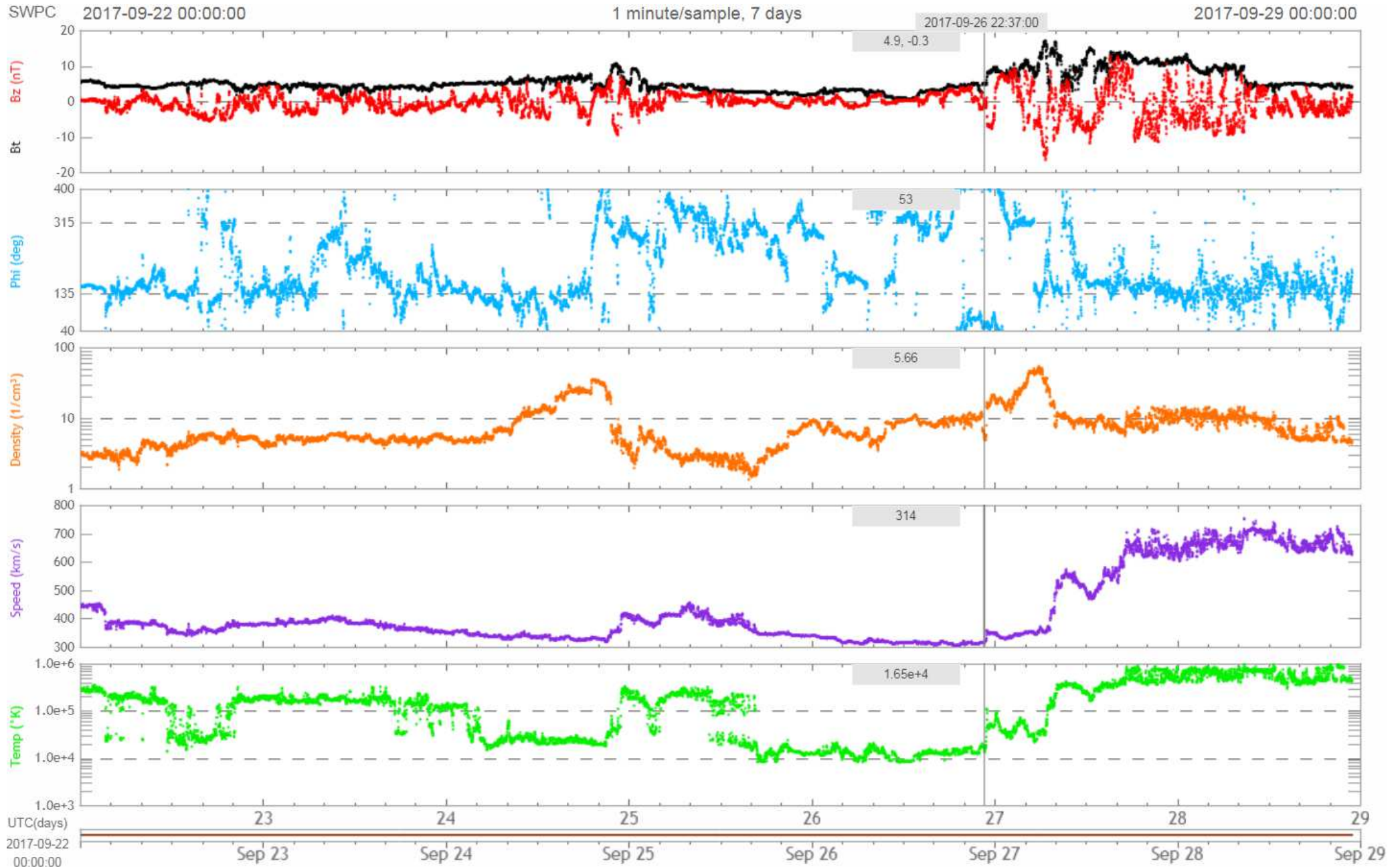
<https://www.spaceweather.com/archive.php?view=1&day=21&month=02&year=2016>



Zhang et al. (2021)

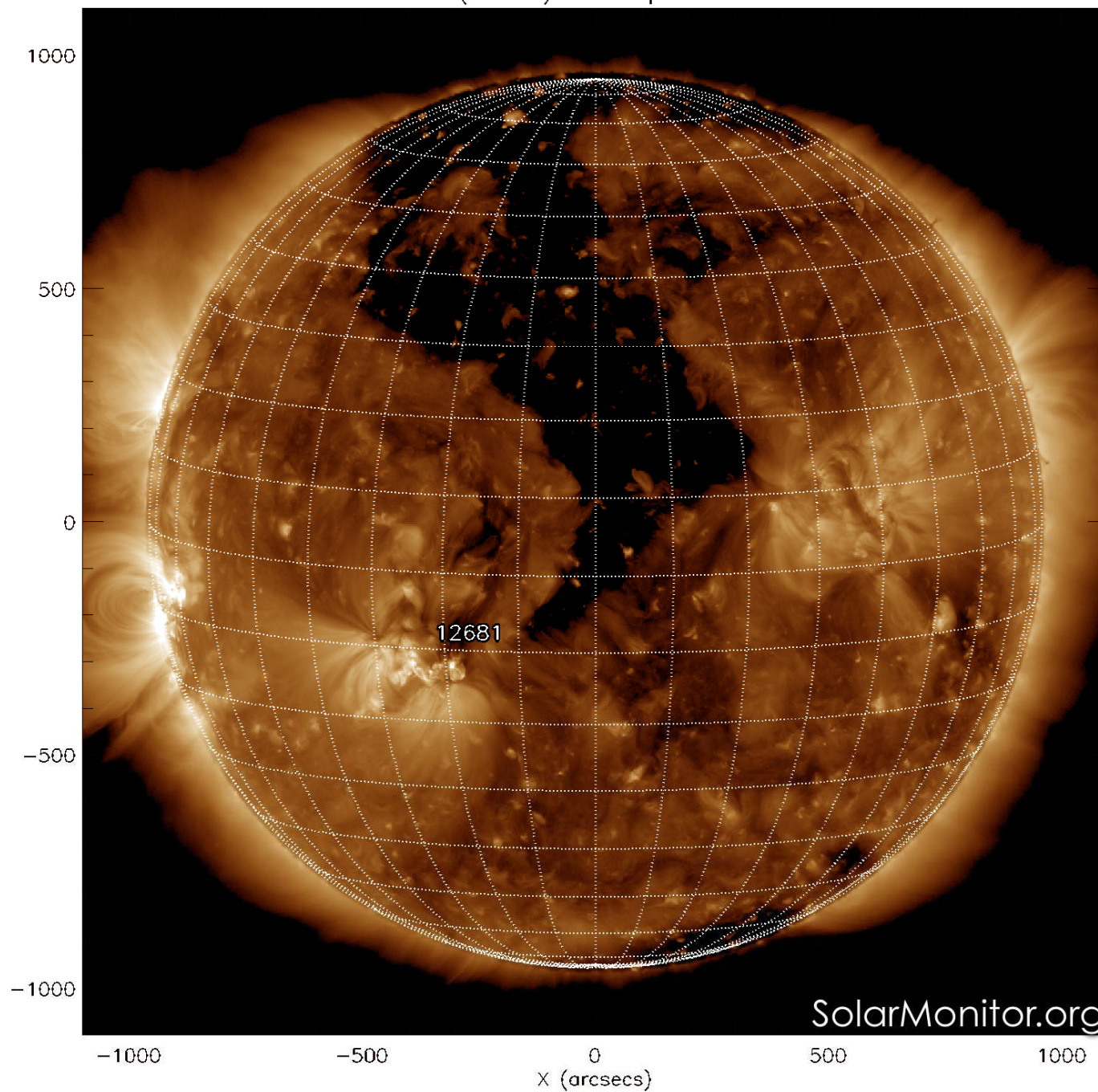


CH ← SIR/CIR ← HSS

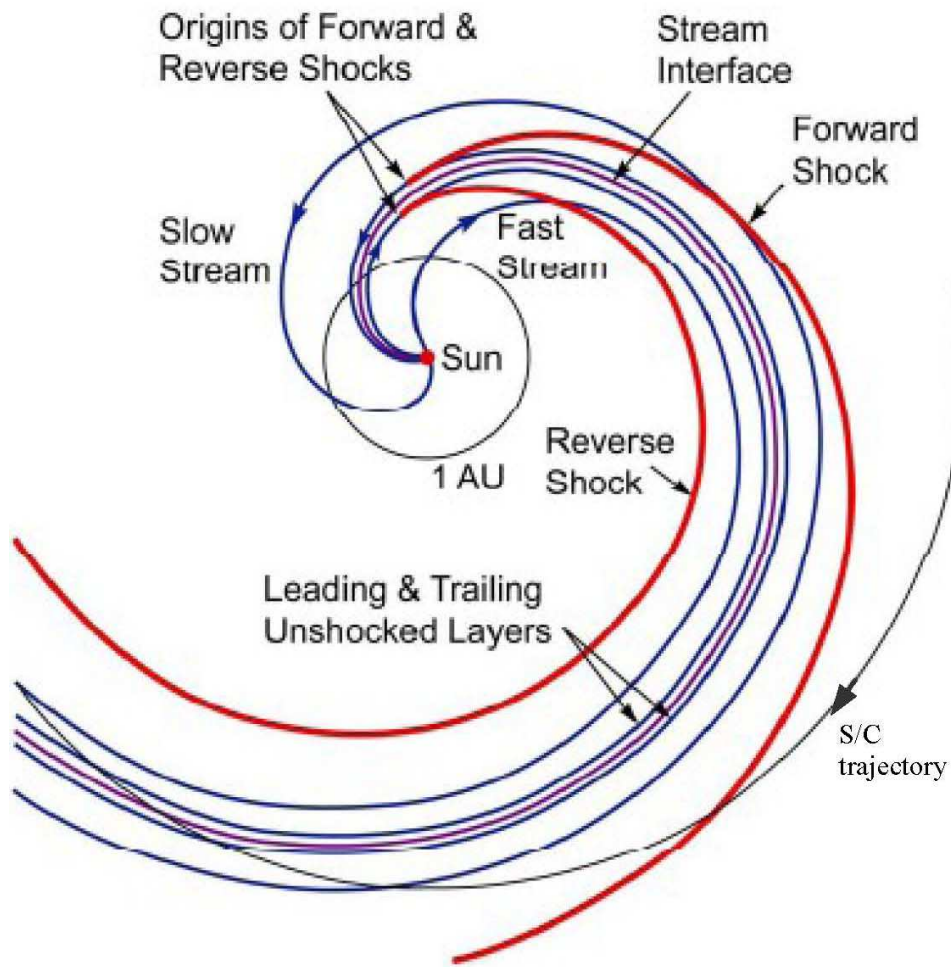


CH ← SIR/CIR ← HSS

SDO AIA Fe XII (193 Å) 24-Sep-2017 23:24:52.840

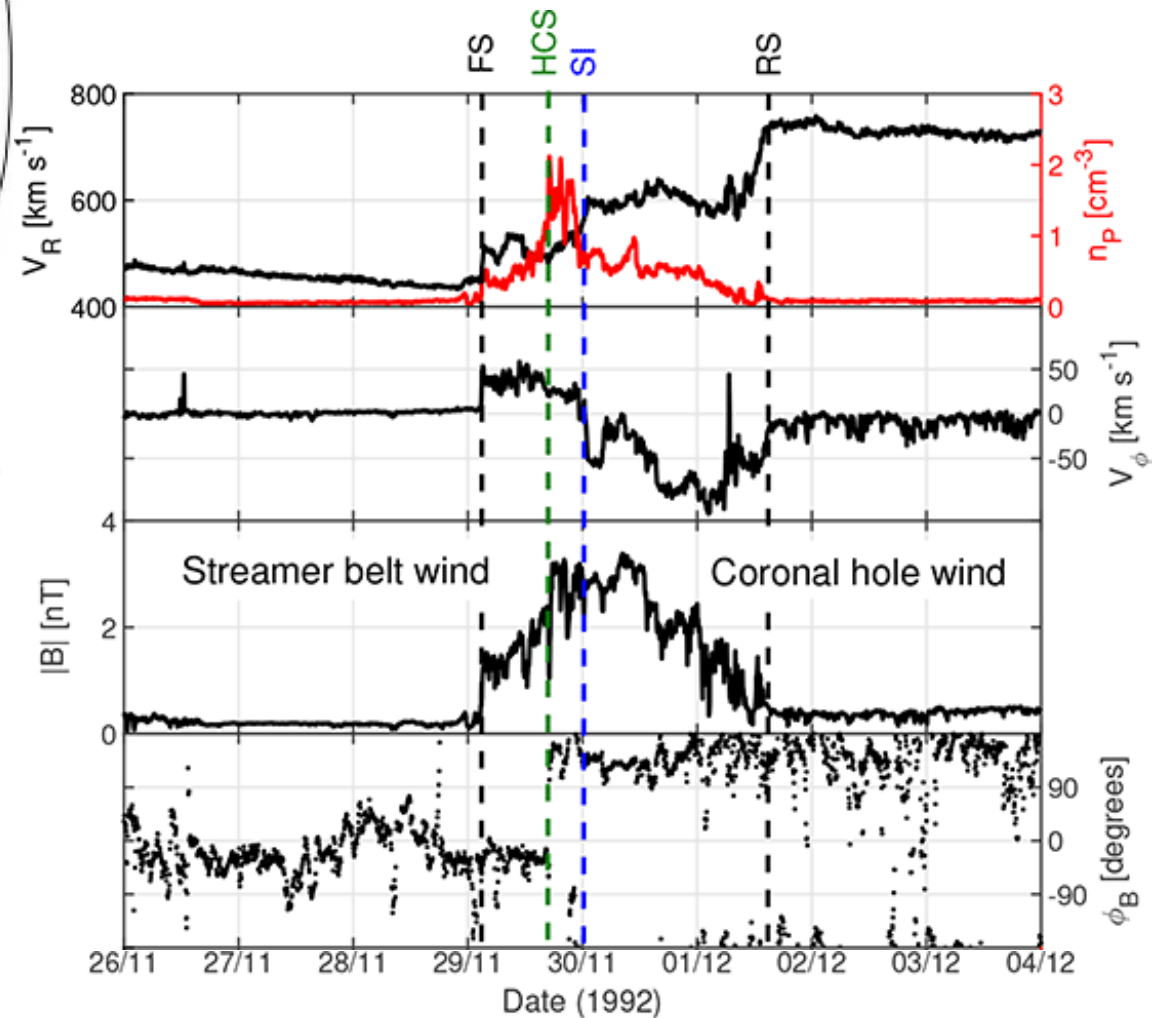


SolarMonitor.org



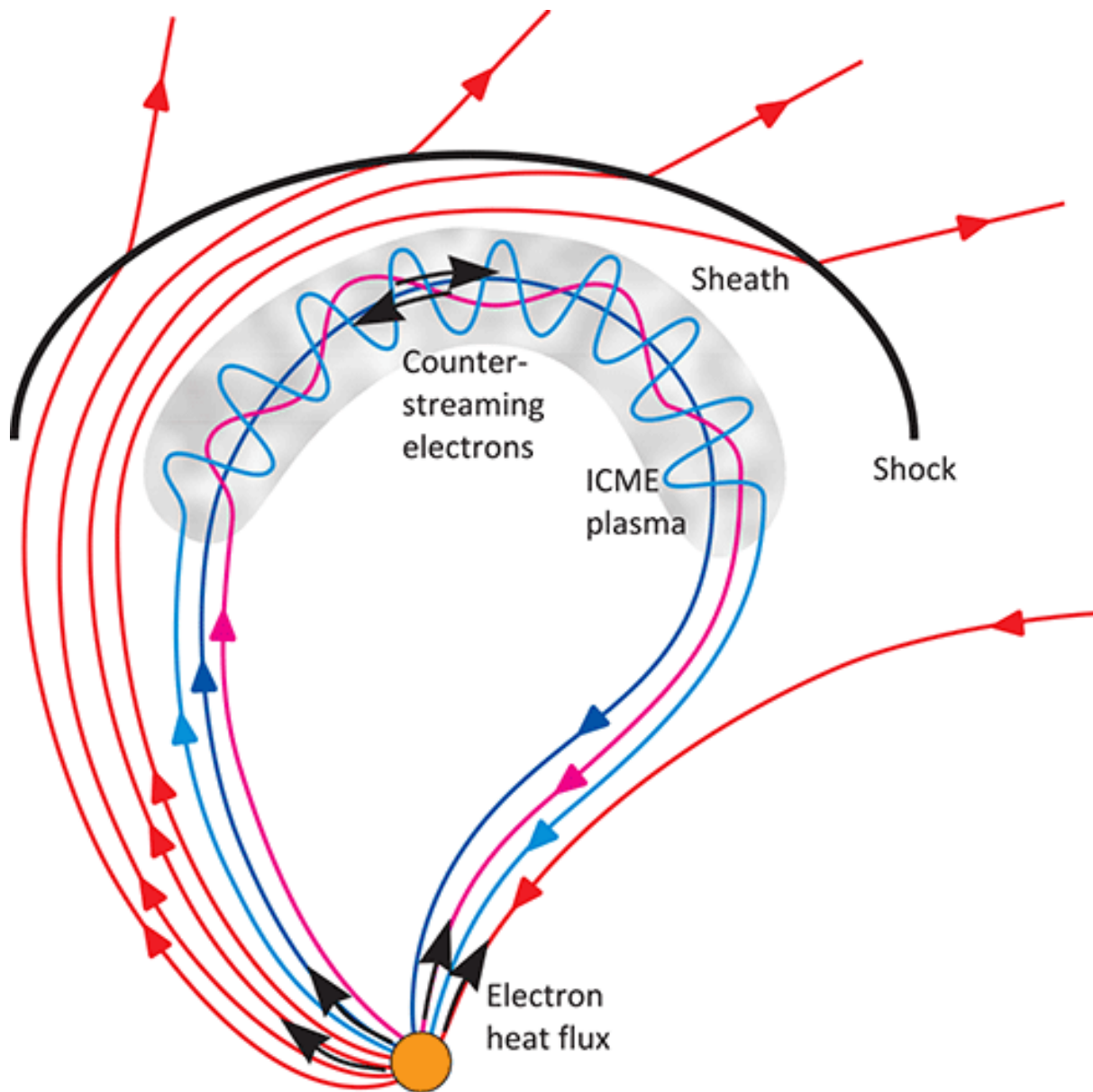
Crooker et al. (1999)

Ulysses observation below the ecliptic plane (-20° latitude) at 5.1 AU

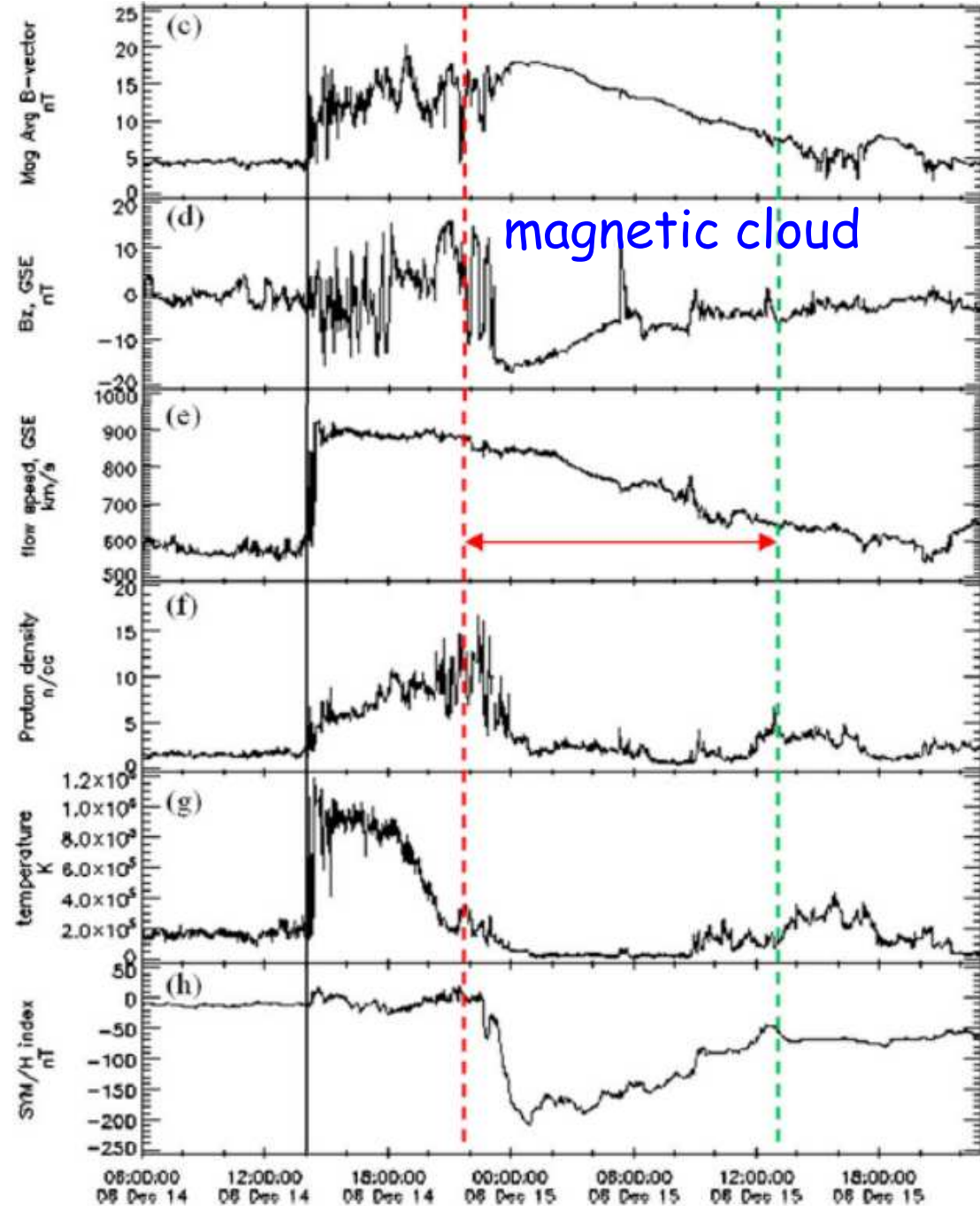
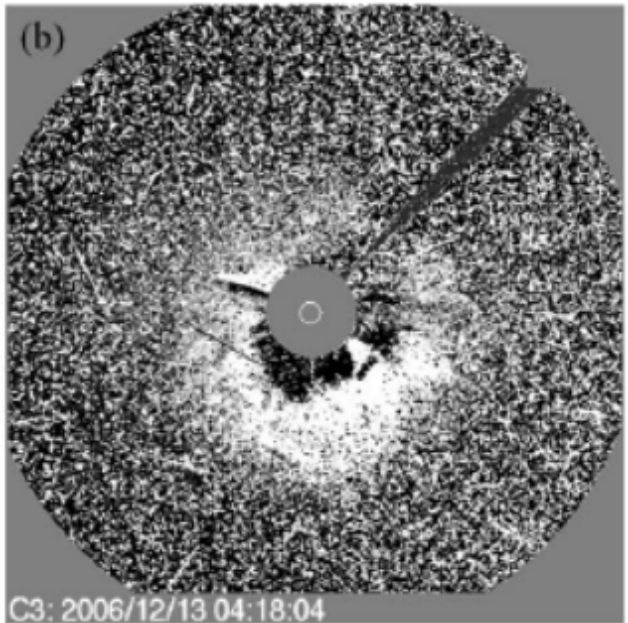
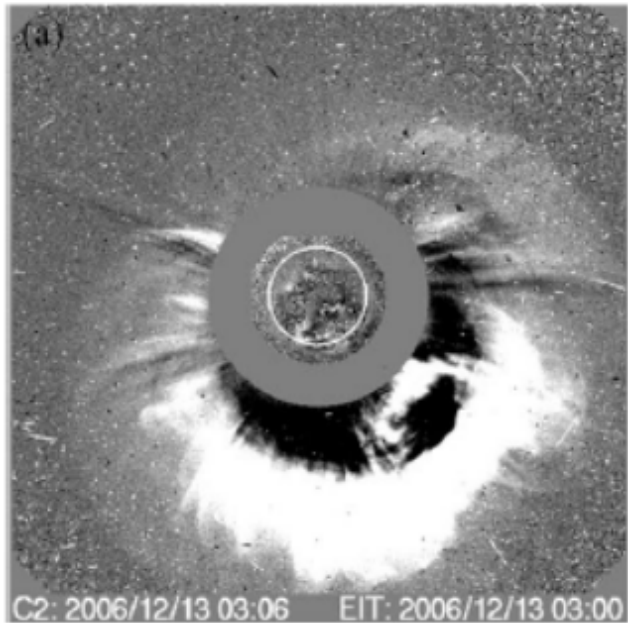


Owens (2020)

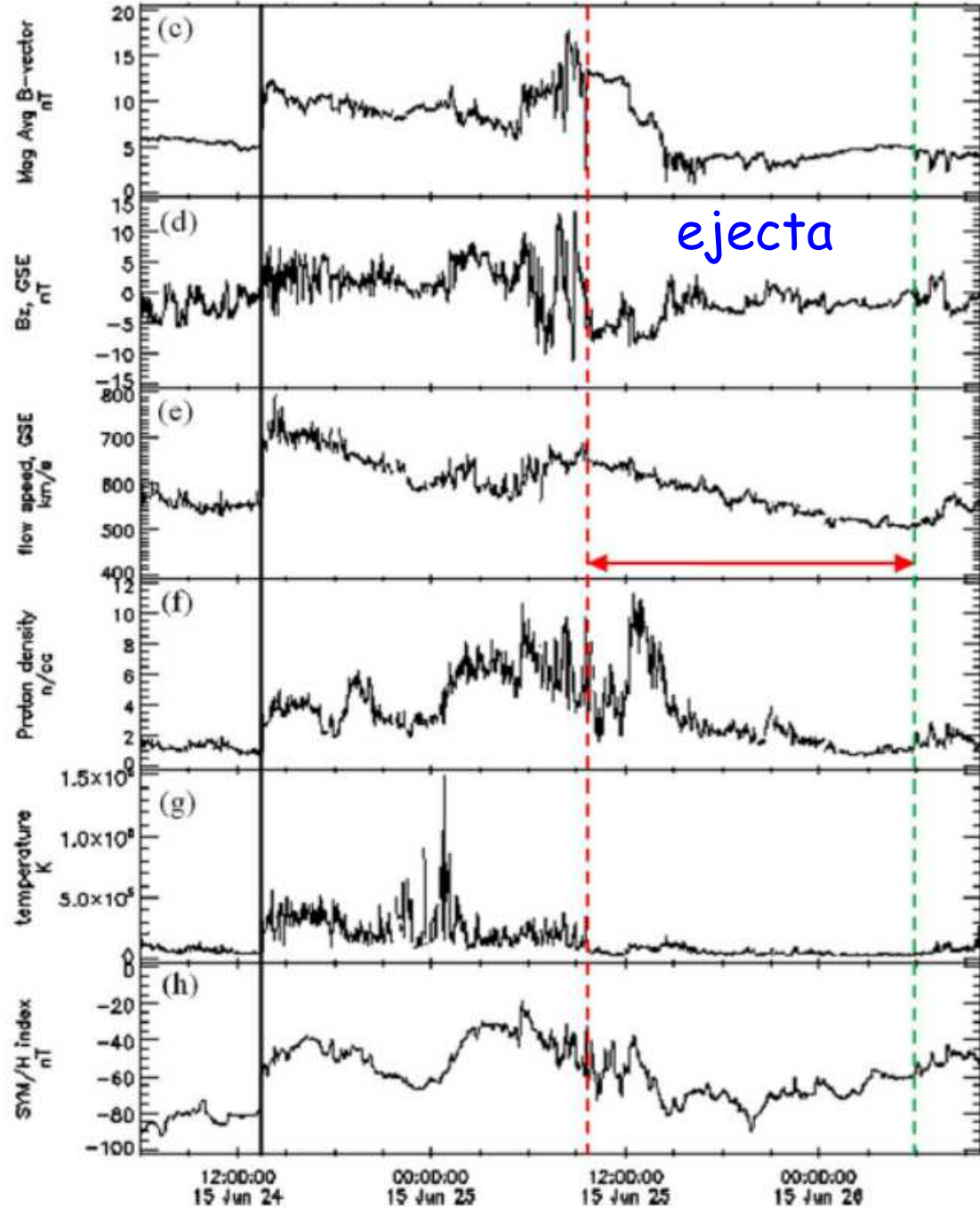
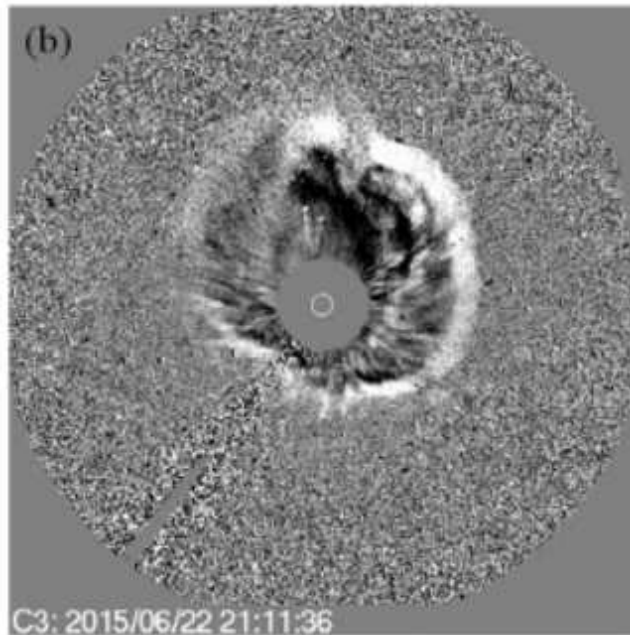
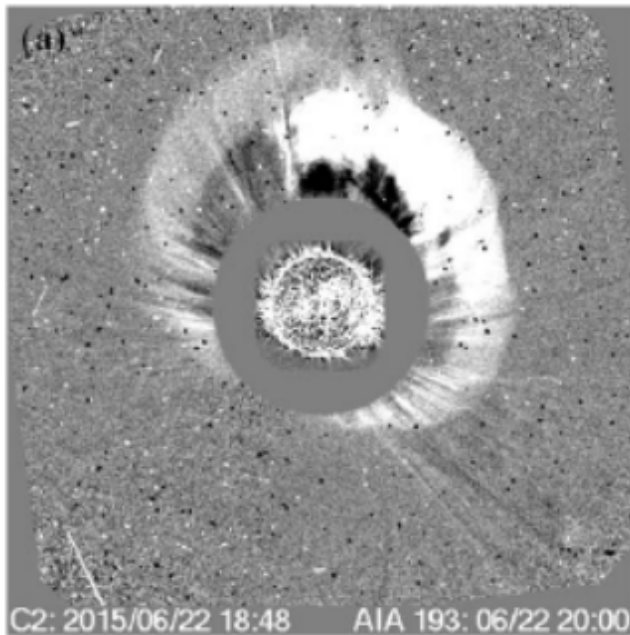
Interplanetary Coronal Mass Ejection (ICME)



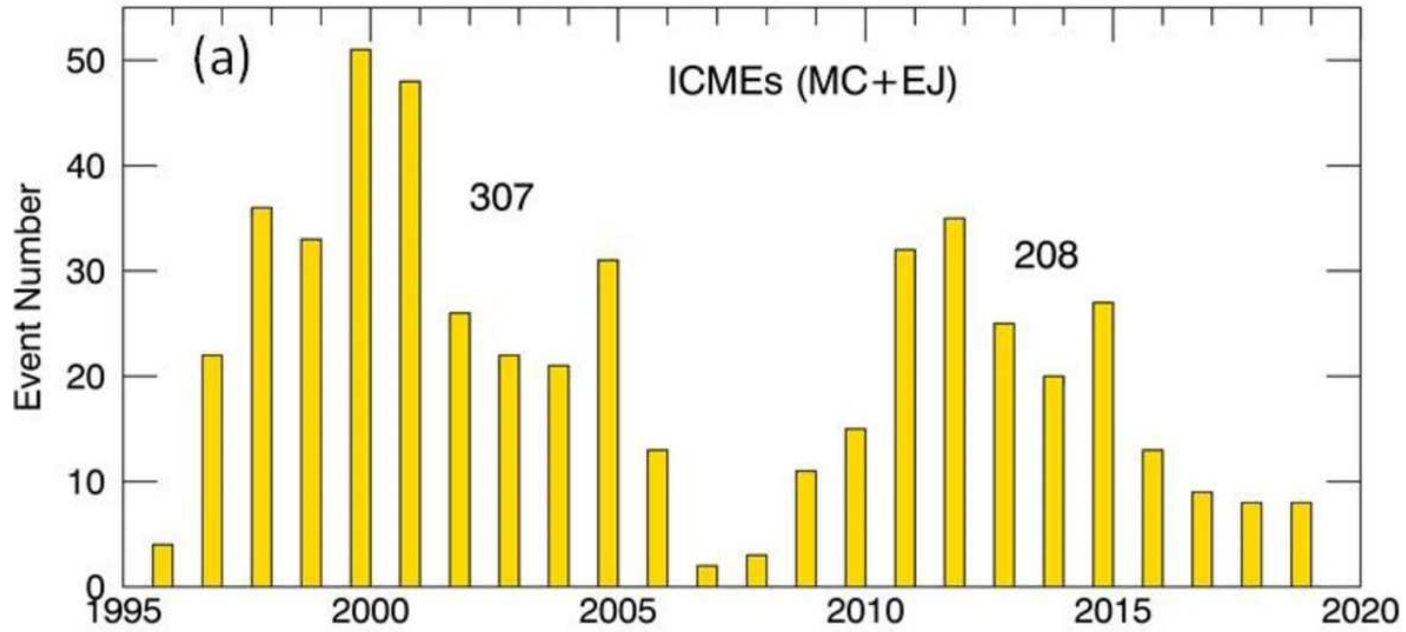
CME \leftarrow ICME (MC/EJ) \leftarrow HSS



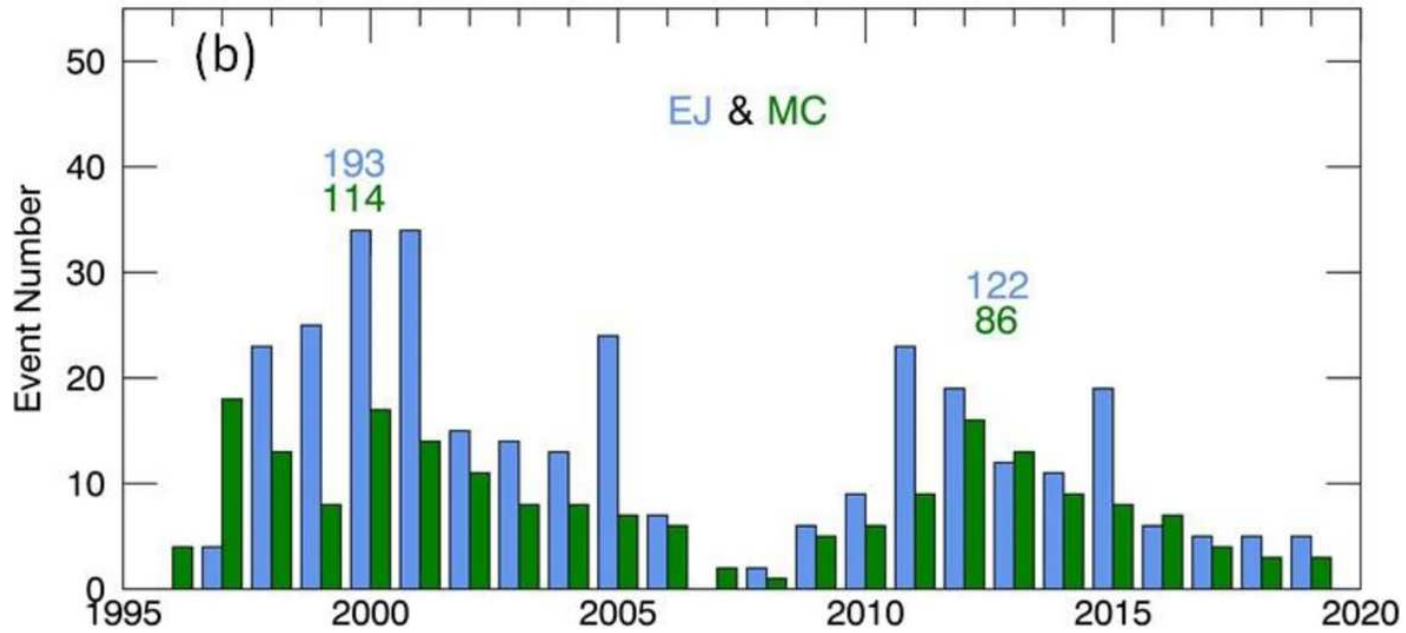
CME \leftarrow ICME (MC/EJ) \leftarrow HSS

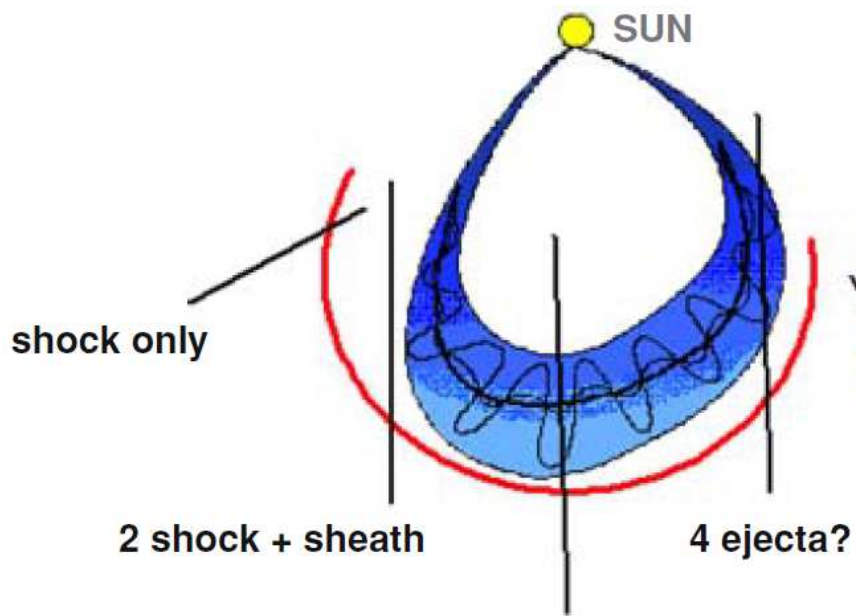


Annual Number of ICMEs from 1996 to 2019

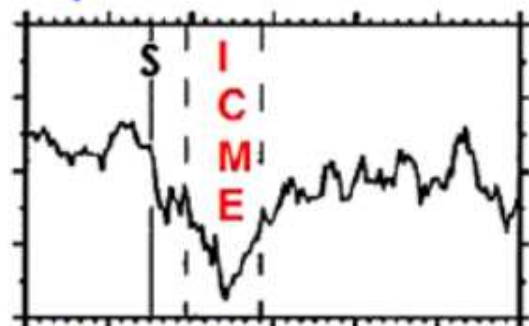
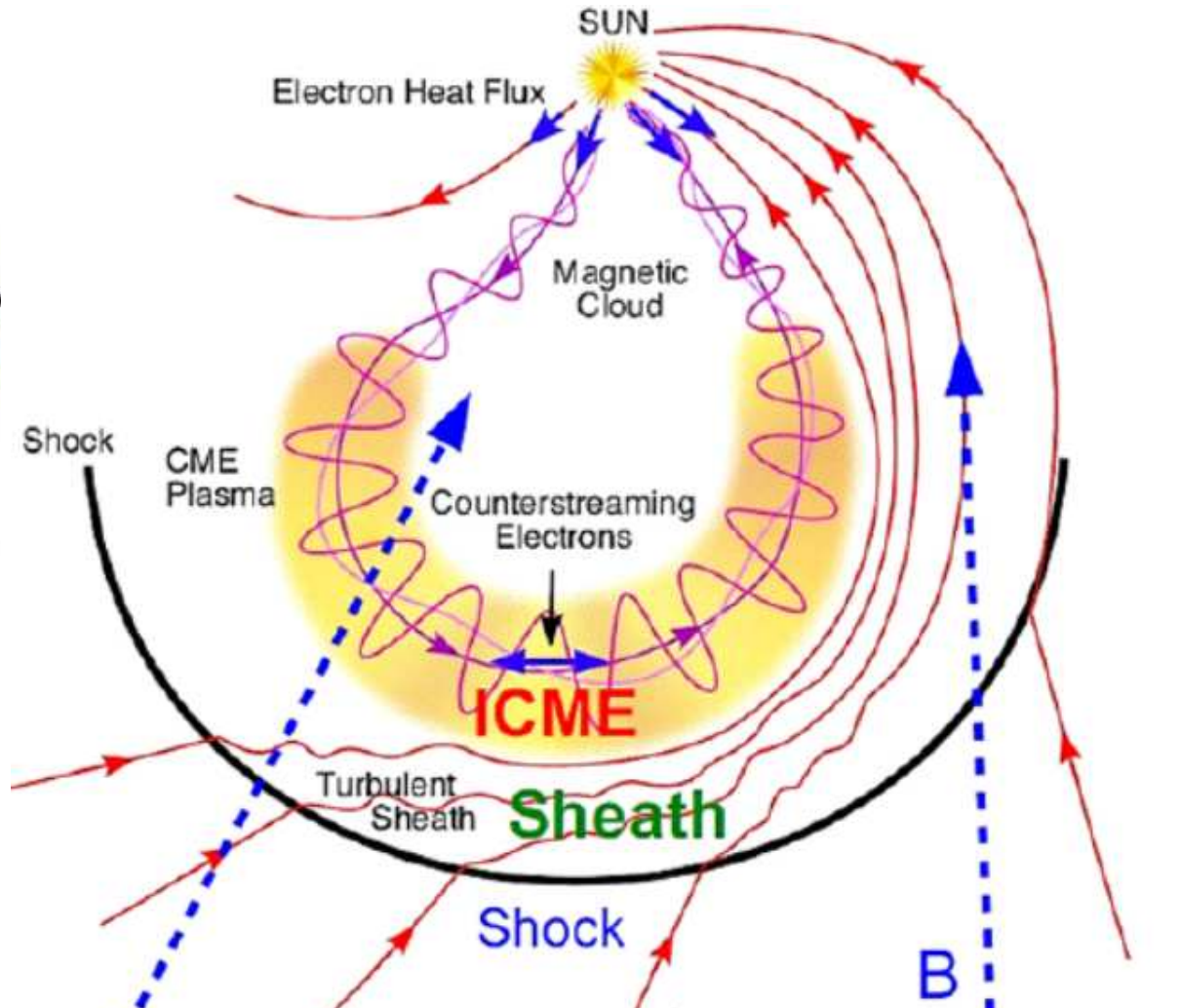
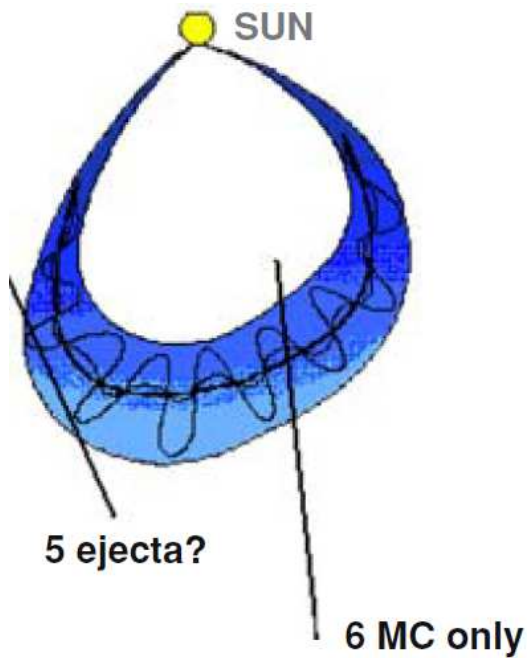


Annual Number of EJs/MCs from 1996 to 2019

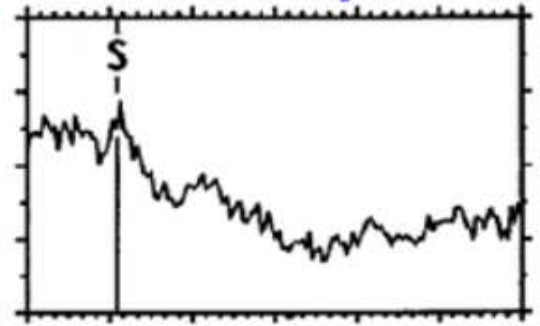




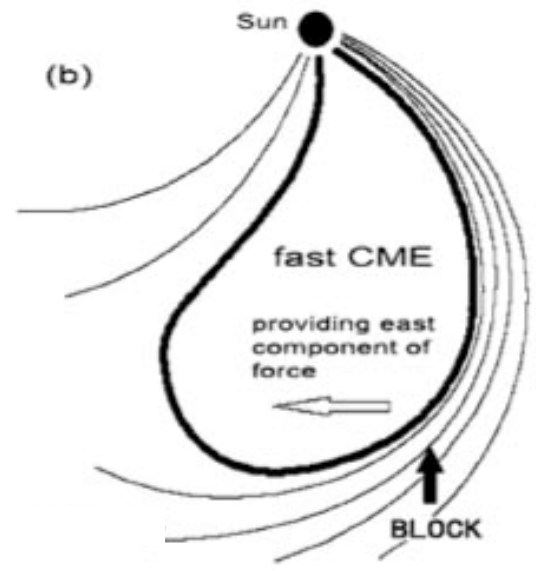
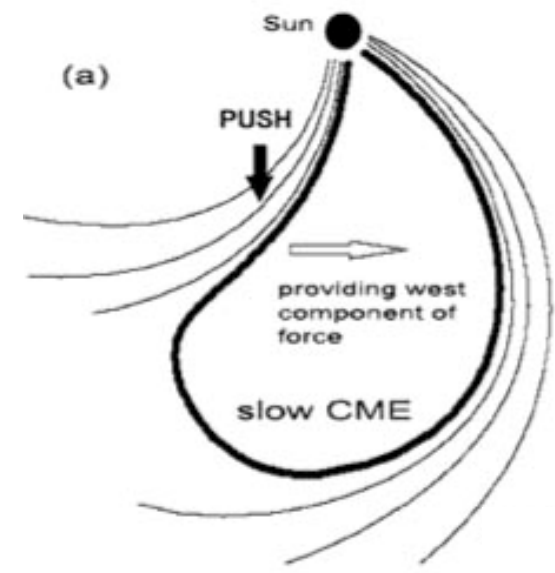
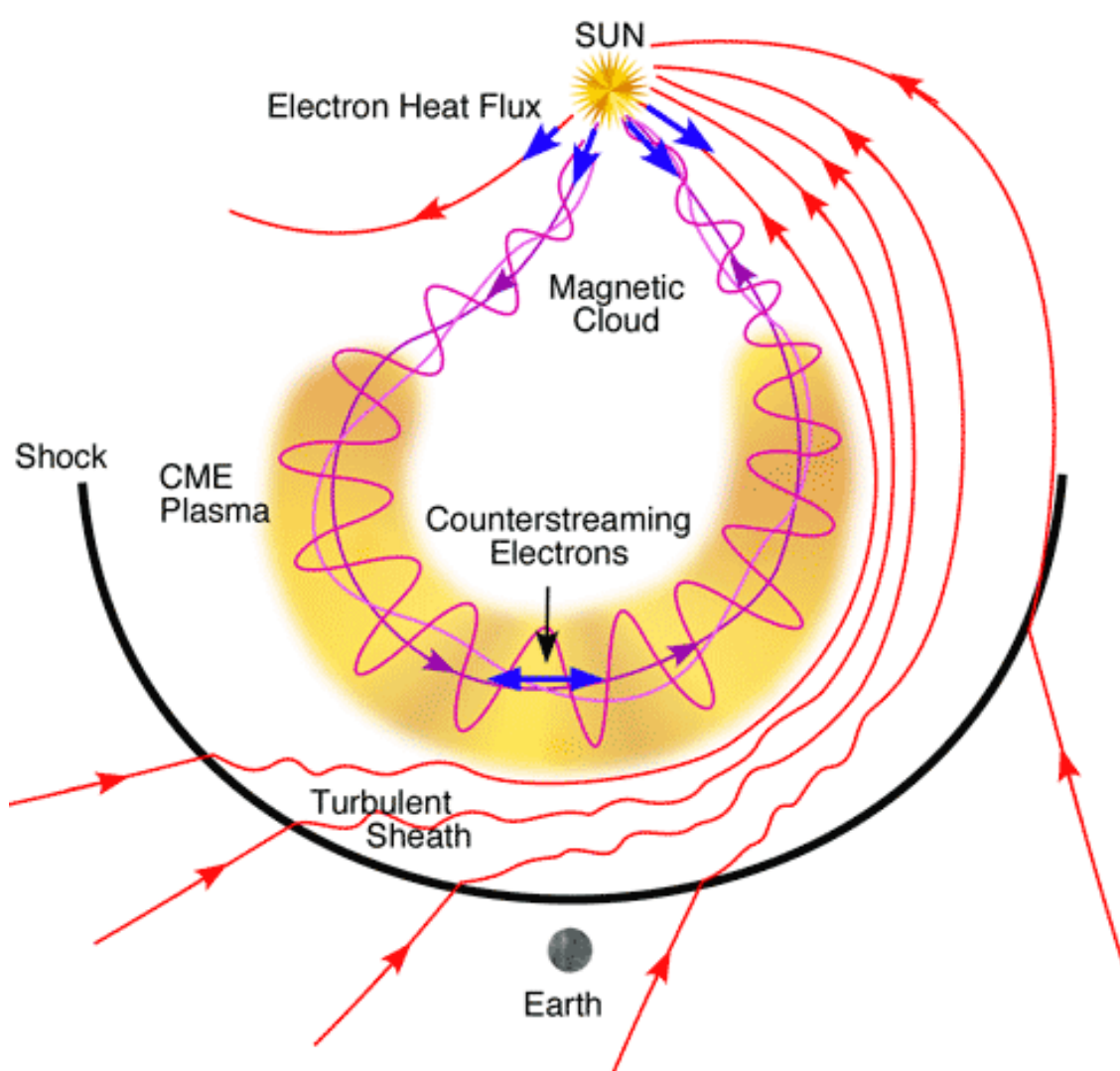
3 shock + sheath + MC



Shock Effect + ICME Effect



Shock Effect Only



Slow CMEs accelerate, fast CMEs decelerate
 → towards the ambient SW speed

Forces acting on CMEs:

(i) Lorentz force (close to the Sun), (ii) Drag force (outer corona)

CMEs deformation:

interaction between (i) multiple CMEs, (ii) ambient solar wind