Magnetic Fluctuation Spectra -> Alfven Wave Frequencies

Feb 10-12 (Day 41-43) 1990
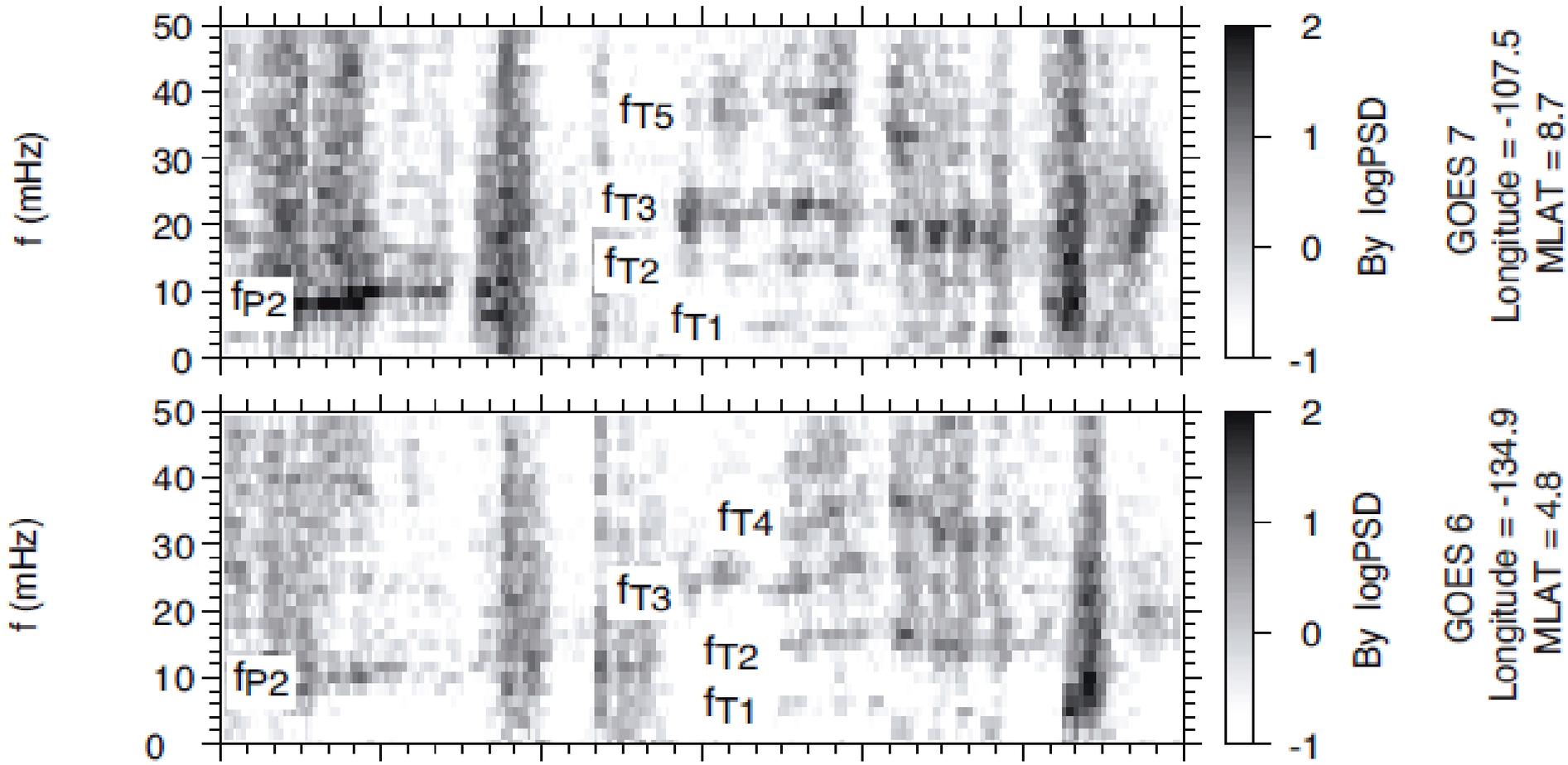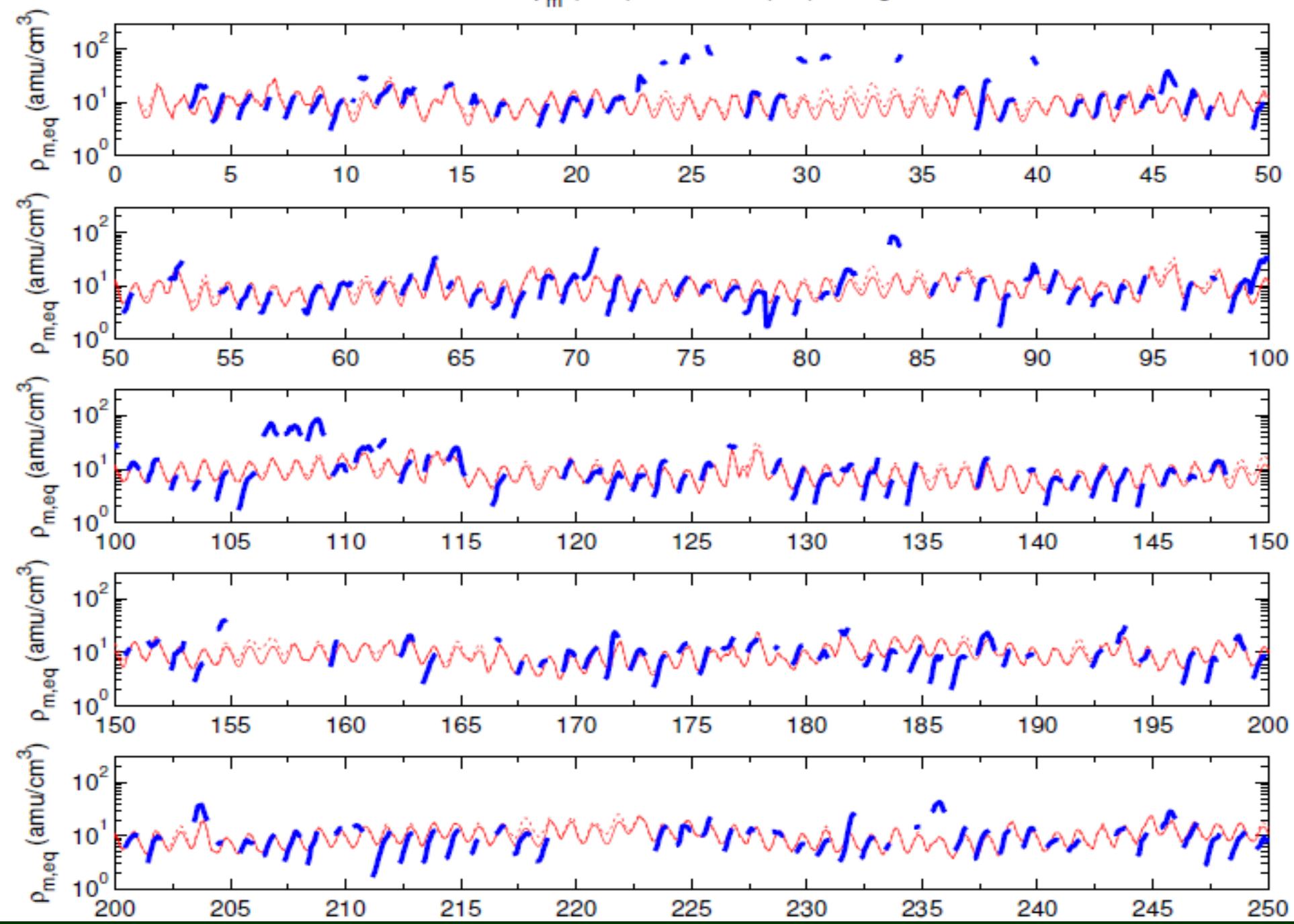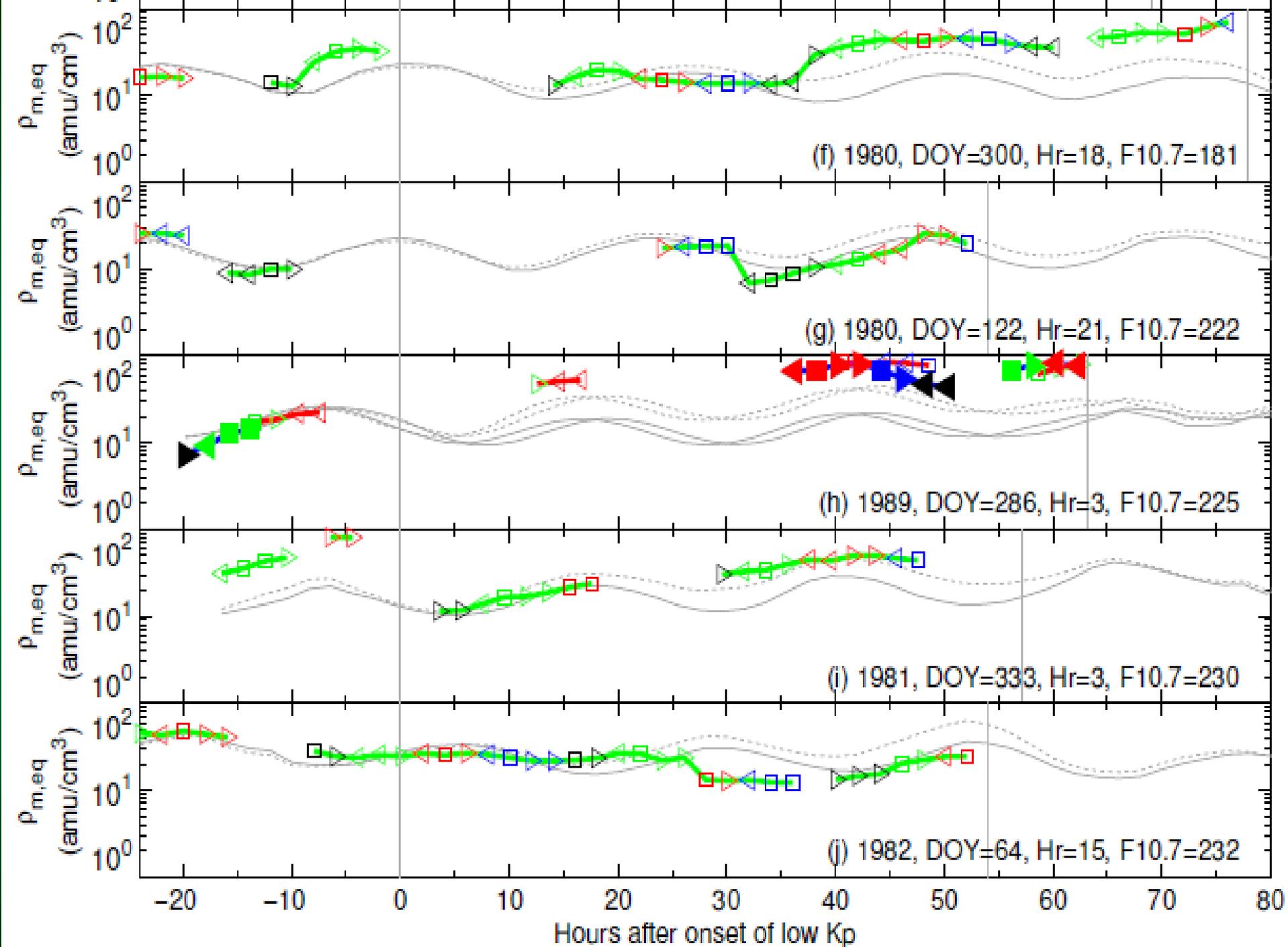
Model for Mass Density at Geo

Alfven frequencies, TS05 magnetic field model, model for field line dependence of ρ_m, Eureqa Formulize ->

$$\log_{10} \rho_{m,eq} = 0.32 + 0.0038 \text{F10.7}_{96} + 0.14 \cos\left((\text{MLT} - 13.0) \cdot 15°\right)$$

$$+ 0.054 P_{\text{dyn},12} + 0.07 \cos\left((\text{dYr} - 0.053) \cdot 360°\right) + 0.016 B_{z,3}$$

[Denton et al., JGR, 2016]

GOES 7 ρ_m (blue) and model (red) during 1988

(f) 1980, DOY=300, Hr=18, F10.7=181

(g) 1980, DOY=122, Hr=21, F10.7=222

(h) 1989, DOY=286, Hr=3, F10.7=225

(i) 1981, DOY=333, Hr=3, F10.7=230

(j) 1982, DOY=64, Hr=15, F10.7=232

Hours after onset of low Kp

Average Refilling
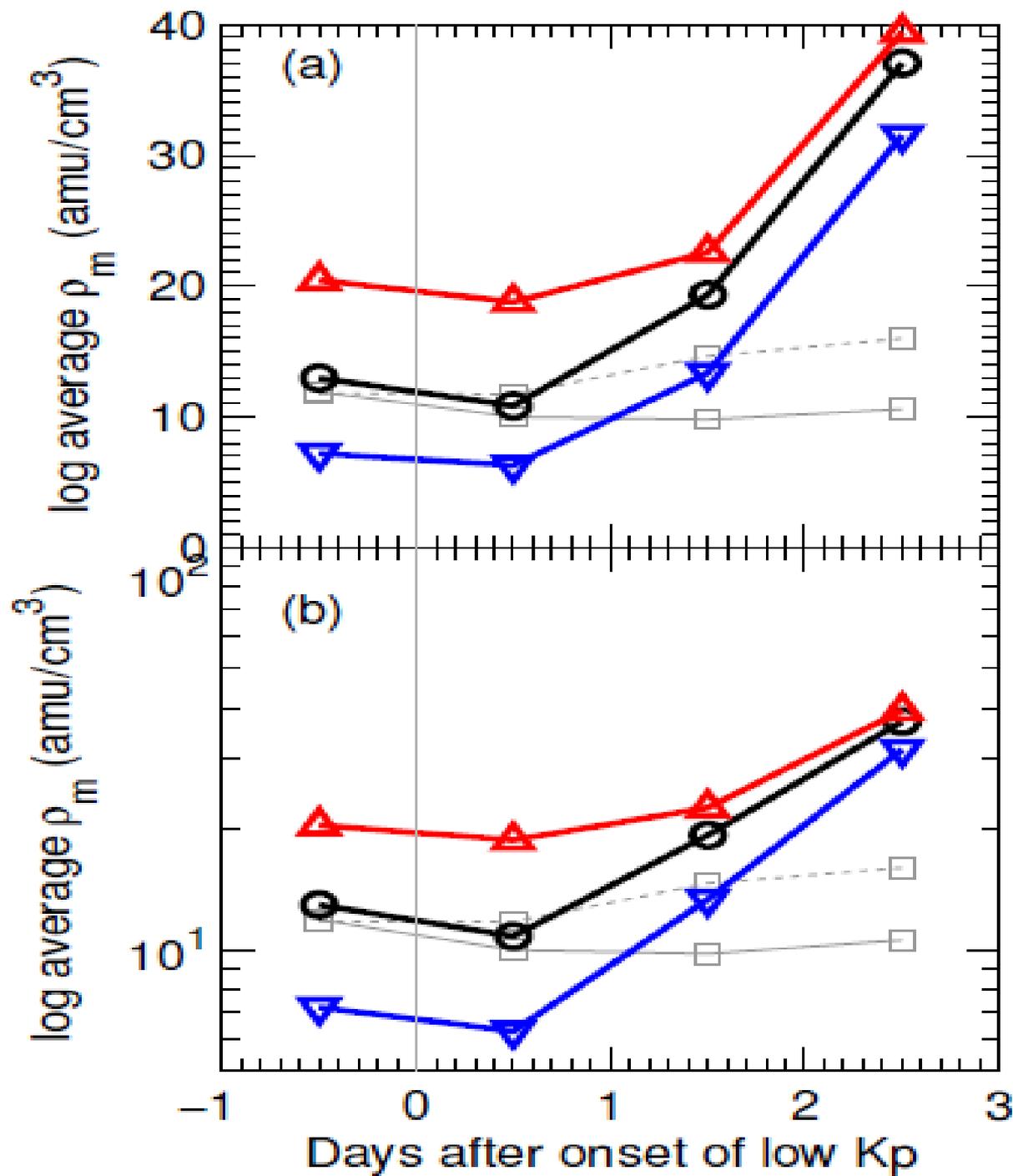
[Denton et al., JGR, 2016]

Logarithmic Refilling Rates

$$\frac{d \log_{10}(\rho_{\mathrm{m,eq}})}{dt} = 0.27 \ \mathrm{day}^{-1}, \text{ for all data,}$$

$$= 0.16 \ \mathrm{day}^{-1}, \text{ for F10.7} > 150 \ \mathrm{sfu}$$

$$= 0.35 \ \mathrm{day}^{-1}, \text{ for F10.7} < 100 \ \mathrm{sfu}$$

[Denton et al., JGR, 2016]