MAARBLE
Empirical model of whistler-mode waves

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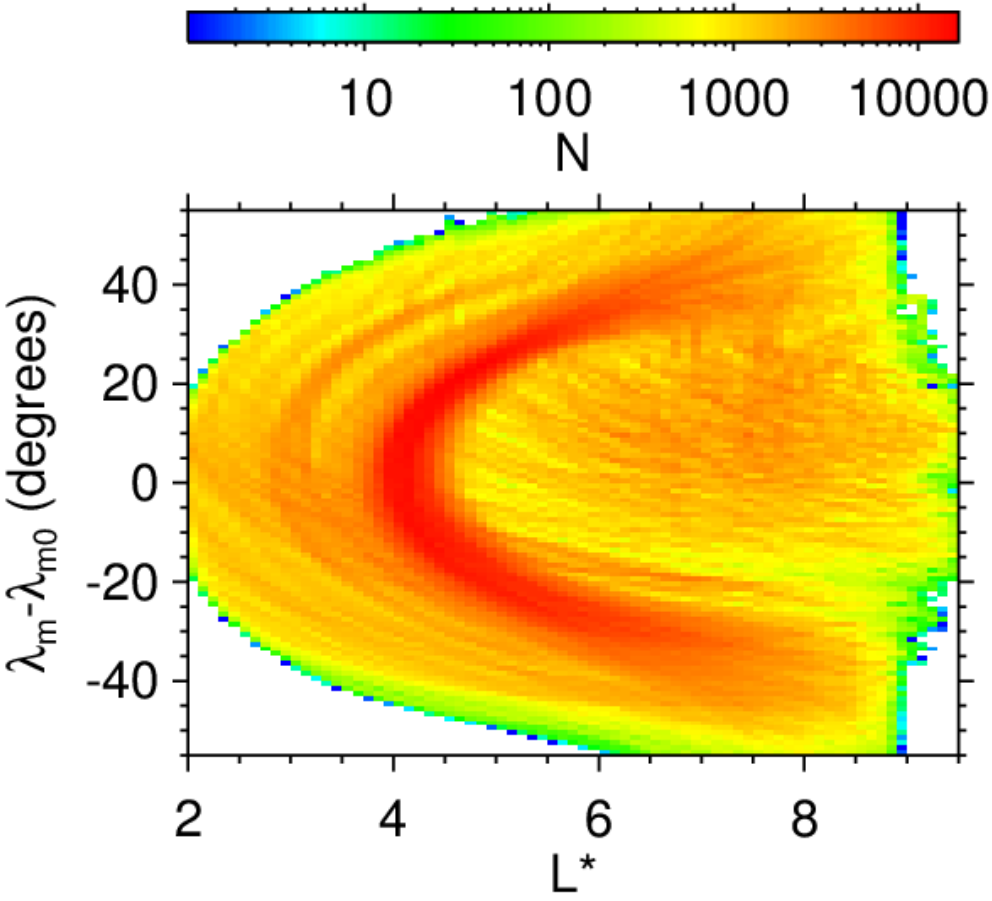
11 years of CLUSTER measurements 2001-2011

- $2\ R_E < R < 11\ R_E$
- $-60^o < \lambda_m < +60^o$
- L* (T89)
- λ_{m0} within $\pm 10^o$
- 4 spacecraft
- Total number of **16×10^6** multicomponent (3B, 2E) spectra

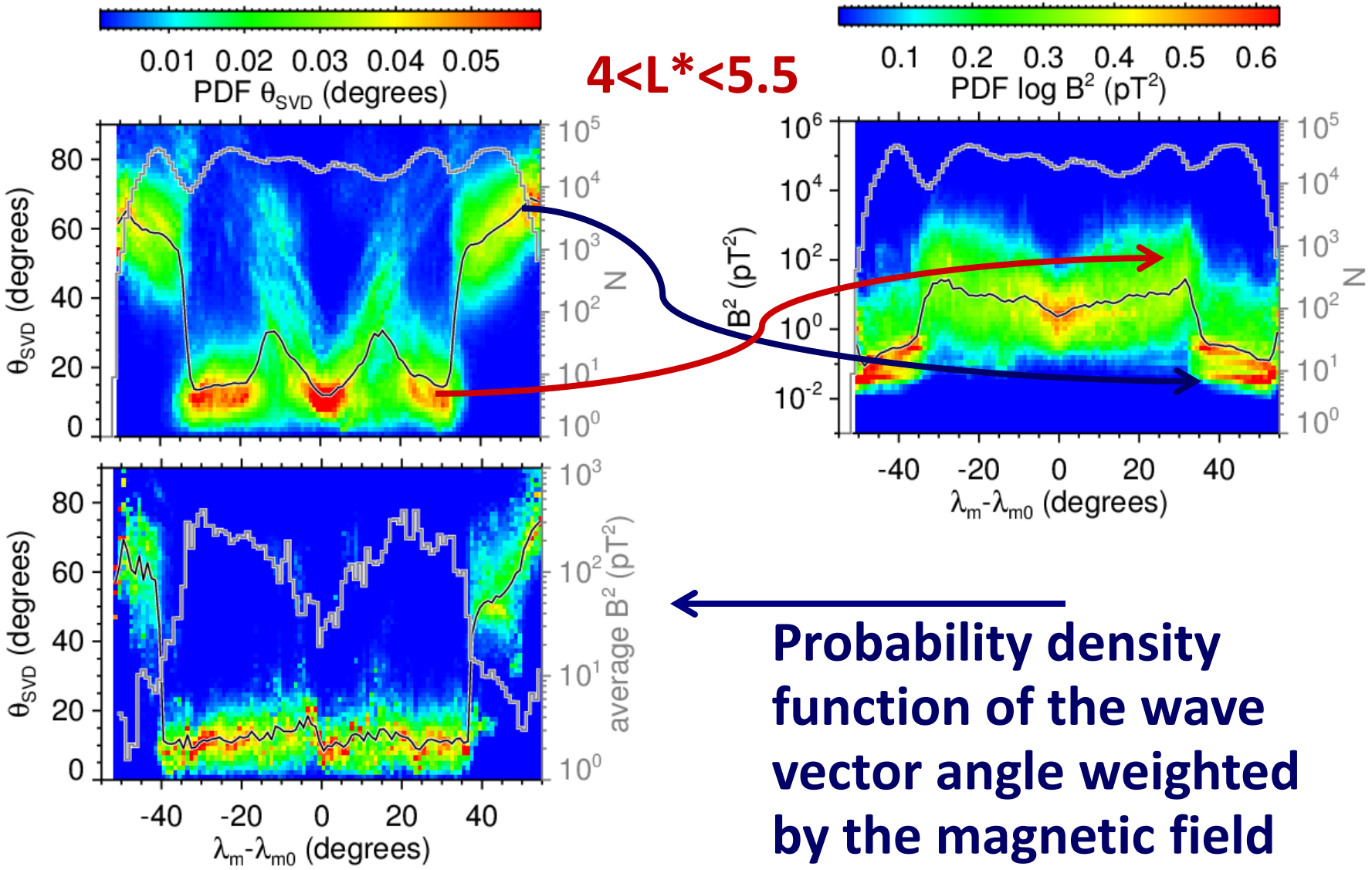
Represented in bins
0.1 L* - 1° λ_m - 0.5h MLT



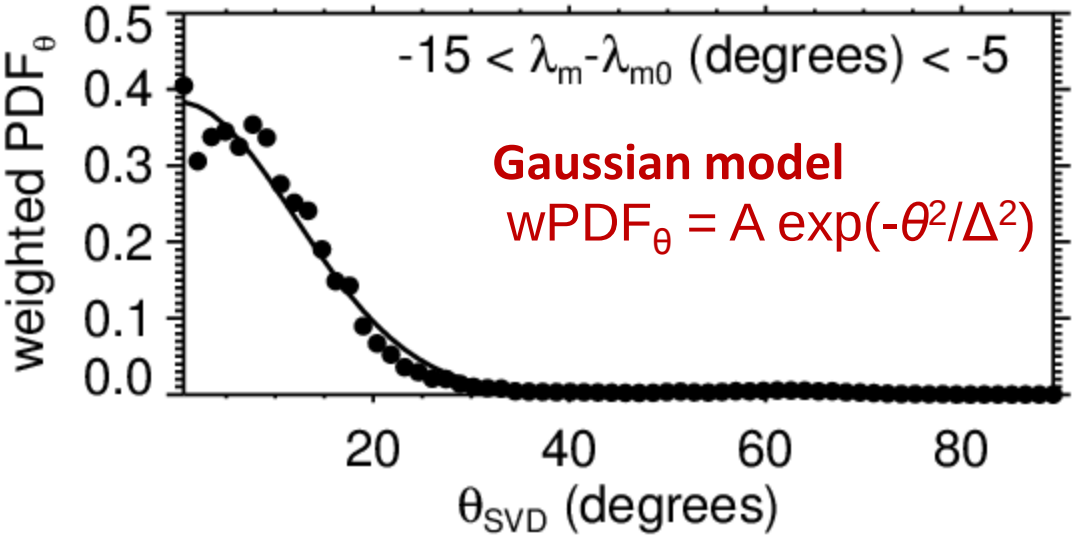
PDF of the wave vector angle

Lower band
$0.1 < f/f_{ce0} < 0.5$

PDF of the magnetic field power

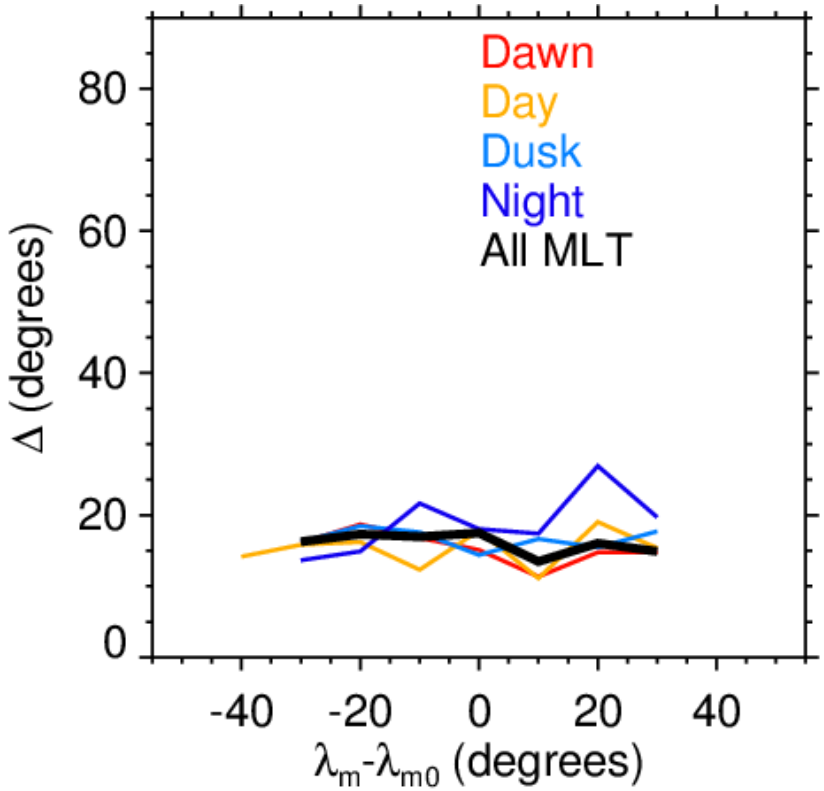


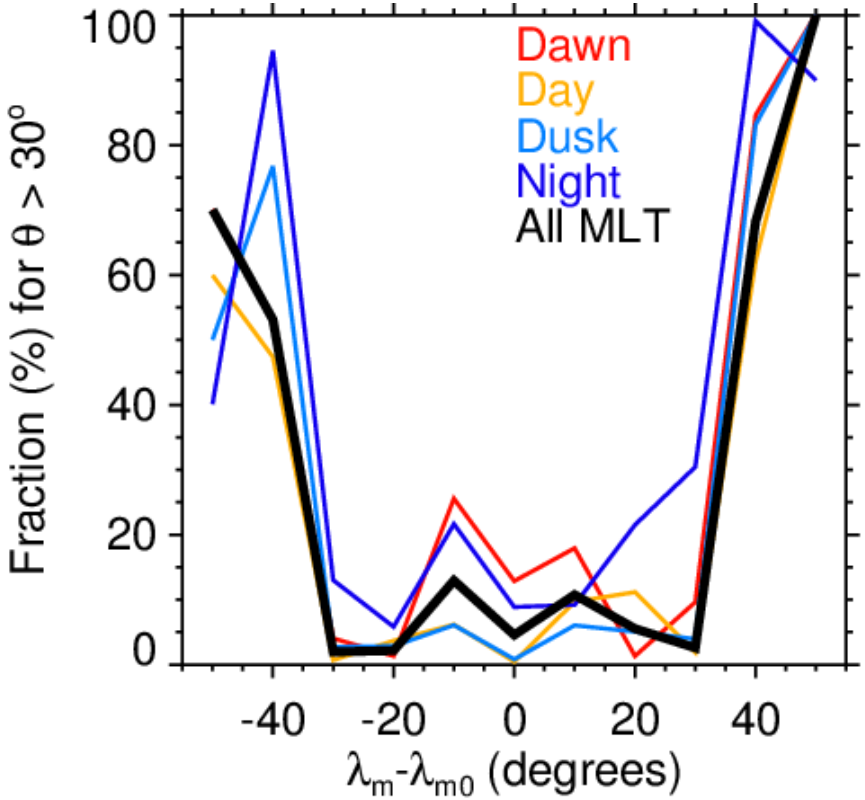
Probability density function of the wave vector angle weighted by the magnetic field power



4<L*<5.5

Fraction of power for θ>30°



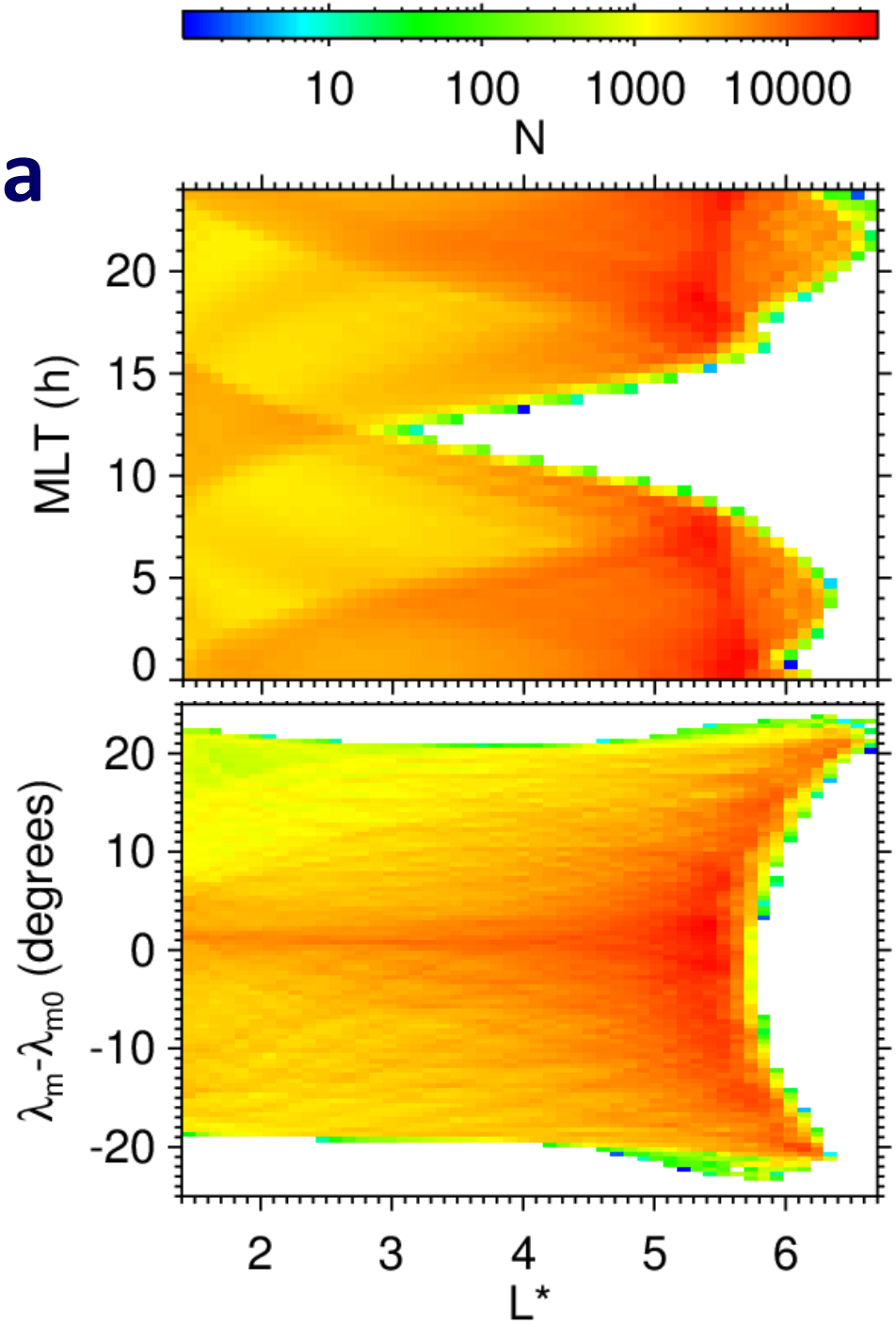


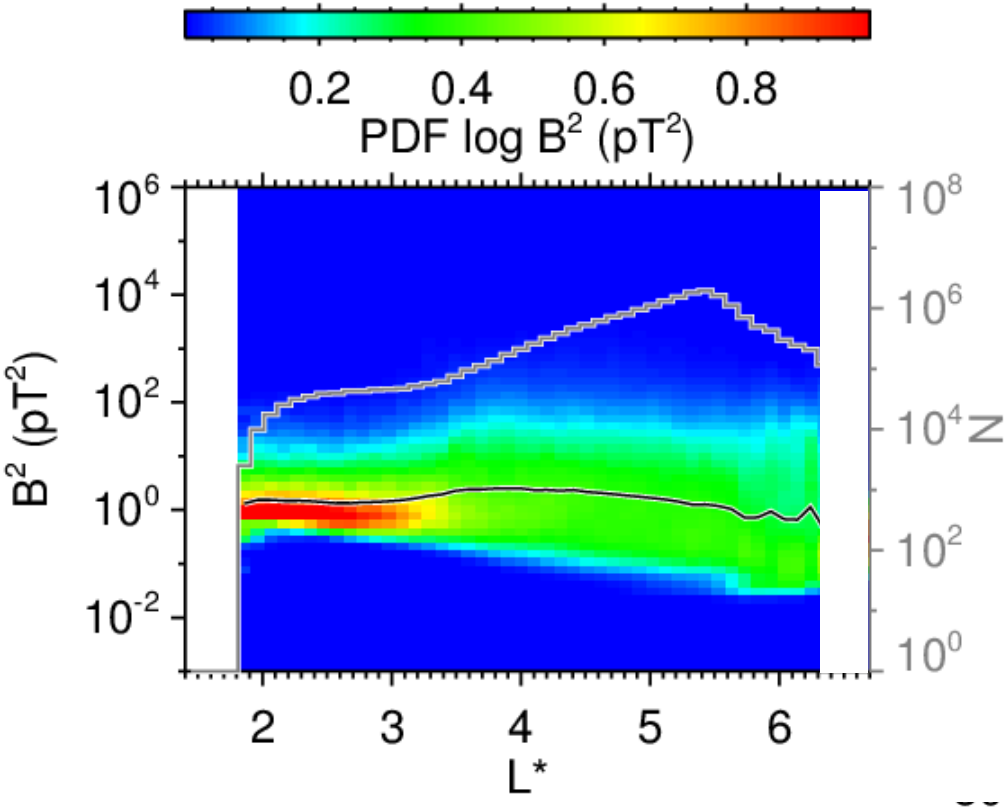
15 months of Van Allen Probes data 9/2012-11/2013

- $L^* < 6.7$
- $-24^o < \lambda_m - \lambda_{m0} < +24^o$
- 2 spacecraft
- multicomponent spectral matrices (3B, 3E)
- 65 frequencies 2Hz-12kHz
- 0.5s every 6s
- 13×10^6 measurements

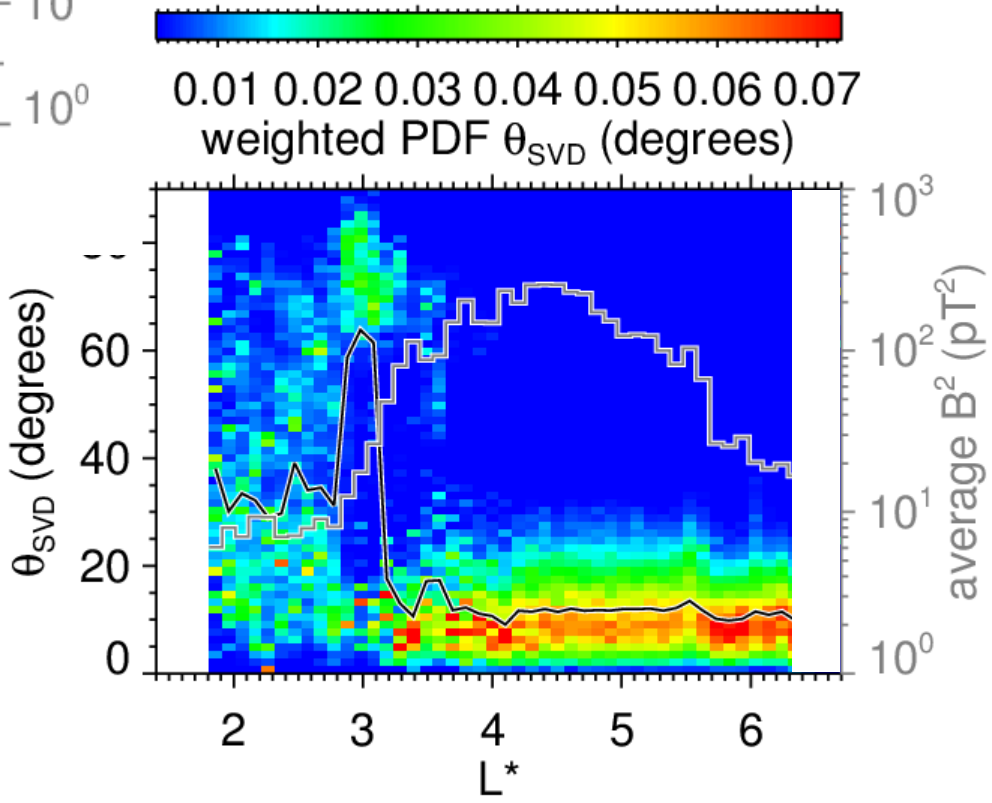
Represented in bins

0.1 L* - 1° λ_m - 0.5h MLT



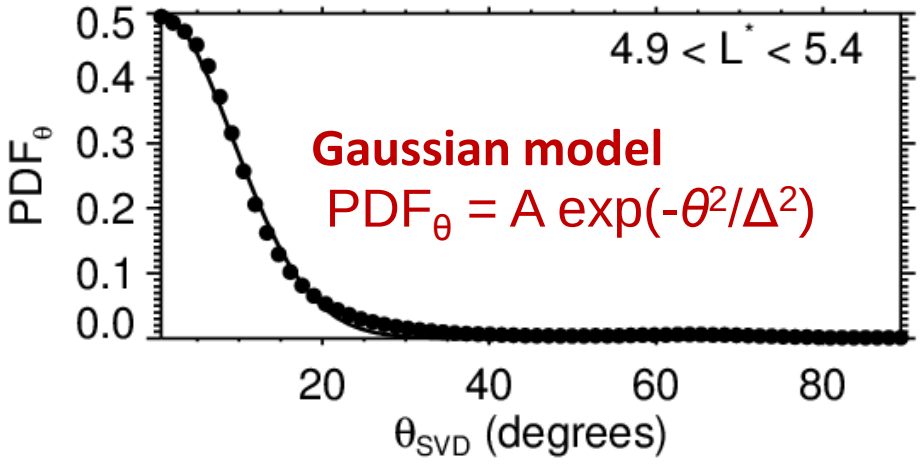


Total magnetic field power
$0.1 < f/f_{ce0} < 0.5$



Probability density function of the wave vector angle weighted by the magnetic field power

Probability density function of the wave vector angle →



Weighted probability density function →