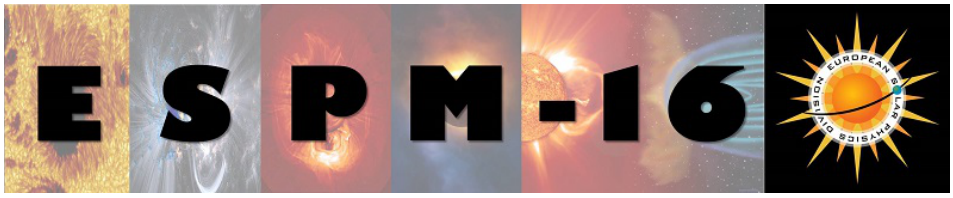

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Analysis of the solar wind distribution functions at 1AU.

Monday, 6 September 2021 15:43 (13 minutes)

This contribution focus on the analysis of the distribution function of different physical magnitudes of the solar wind. The data set comes from the ACE spacecraft located at the L1 point and covers almost two solar cycles, from 1998 to 2017.
We propose a bi-Gaussian distribution, formed by the addition of two Gaussian distribution functions, to characterize the solar wind. Each Gaussian function corresponds to the contribution of one of the different regimes of the bulk solar wind: fast and slow wind.
We apply this approach not only to the proton speed, but also for the interplanetary magnetic field magnitude, proton temperature and proton density, and we obtain a bimodal distribution which allow us to characterize each regime of the bulk solar wind.
Our results also show a clear correlation between some fitting parameters and the solar cycle.
We also apply the Bi-gaussian approach to the solar wind composition, more precisely to the average iron charge state. From these results we are able to identify interplanetary coronal mass ejections which were not included in previous catalogues.

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