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Type: **Oral presentation**

Turbulence and Heating in space plasma

vendredi 12 février 2021 14:00 (15 minutes)

Voyager 2 revealed that the solar wind ion temperature decreases (up to 40 AU) slower than what is expected from the adiabatic radial expansion model of the wind. A possible answer to this discrepancy is a local heating allowed by turbulence. Indeed, in turbulence theories energy contained at large scales cascades to smaller scales (because of the nonlinearities in the system) until it is eventually dissipated at the smallest scales (by some kinetic effects) into particle heating. Understanding turbulence is therefore the way to better understand the solar wind heating problem.

We tackle this problem using fluid models and the formalism of the exact law introduced by Kolmogorov in 1941. We derive the most general laws to date that govern compressible Hall-MHD turbulence, test them in numerical simulations before we apply them to in-situ observations provided by Parker Solar Probe (PSP) or the Magnetospheric Multiscale Mission (MMS). PSP is a single satellite orbiting since 2018 closer and closer to the Sun, whose main objective is the study of the solar corona and the inner solar wind. MMS is a cluster of four satellites orbiting in the Earth's magnetosphere since 2015.

In this talk, I will introduce the interest of leading such studies then discuss briefly my main results.

Field

Solar & Stellar Physics

Day constraints

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Classification de Session: Talk

Classification de thématique: Astrophysics