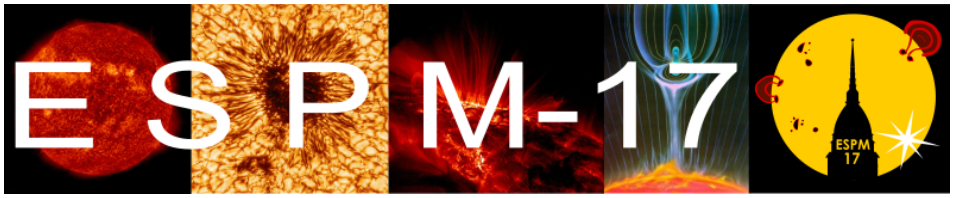

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Anisotropic density turbulence from the Sun to 1 au: remote and in-situ observations

Radio signals propagating via solar corona and solar wind are significantly affected by density fluctuations, impacting solar radio burst properties as well as the observations of sources viewed through the turbulent atmosphere. Using large-scale simulations of radio-wave transport, the radial profile of anisotropic density turbulence from the low corona to 1 au is explored. For the first time, a profile of Heliospheric density fluctuations is deduced that accounts for the properties of extra-solar radio sources, solar radio bursts, and in-situ density fluctuation measurements in the solar wind at 1 au. Combining the anisotropic turbulence model with the space-craft frequency broadening measurements radial and perpendicular to radial velocities are deduced. The deduced properties of turbulence could be used to estimate the energy deposition rates due to Landau damping ion-sound waves and specific energy rate Alfven wave turbulent cascade at large scales.

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