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Compressive turbulent cascade and heating in solar wind

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Incompressible and isotropic magnetohydrodynamic turbulence in plasmas can be described by an exact relation for the energy flux through the scales. This Yaglom-like scaling law has been recently observed in the solar wind above the solar poles observed by the Ulysses spacecraft, where the turbulence is in an Alfvénic state. An analogous scaling law, suitably modified to take into account compressible fluctuations, is observed more frequently in the same dataset. Large scale density fluctuations, despite their low amplitude, play thus a crucial role in the basic scaling properties of turbulence. The turbulent cascade rate in the compressive case can moreover supply the energy dissipation needed to account for the local heating of the non-adiabatic solar wind.