SOLAR WIND TURBULENCE: CASCADE, DISSIPATION AND HEATING

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We review recent finding of the inertial range cascade in solar wind turbulence, derived from in-situ observations. We show that, despite their small amplitude, density plays a key role in the scaling behaviour of solar wind turbulent cascade. Such observation provides for the first time a direct estimation of the turbulent energy transfer rate, which contributes to the *in situ* heating of the wind. In fact solar wind plasma is known to cool down while it is blown away from the sun more slowly than expected from an adiabatic spherical expansion. Some source of heating is thus needed to explain the observed temperature radial profile. We show that the value of turbulent cascade contribution, as observed from solar wind turbulence, suffices for the total heating, and is strongly correlated with the wind temperature.