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Modification and relaxation of turbulence behind interplanetary shocks

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The solar wind is a weakly collisional super-Alfvenic expanding flow of the ejected solar plasma. This flow is highly turbulent and it plays an essential role in solar wind heating. Interplanetary shocks (IP) are an inseparable part of the solar wind and they increase the solar wind temperature via dissipation of a portion of the kinetic energy at the shock ramp. In downstream of IP shocks, turbulence is enhanced with respect to a level of upstream plasma fluctuations. We used the high cadence (31 ms) plasma measurements from the BMSW instrument on board the Spektr-R spacecraft. A unique time resolution allows us to study the transition from an inertial range of turbulence up to the scales where the kinetic effects become dominant. In this paper, we focus mainly on a relaxation of the increased level of the turbulent fluctuations showing that it takes hours for the solar wind to reach its un-shocked upstream state.