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Intermittency of density fluctuations upstream and downstream interplanetary shocks

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The statistical properties of density fluctuations in a turbulent solar wind flow in the vicinity of interplanetary (IP) shocks are observed. We analyze probability distribution functions (PDFs) of density fluctuations in the frequency range of 0.01-10 Hz according to measurements of the BMSW instrument on board of Spektr-R. We determine high order structure functions, their moments and scaling properties of PDFs upstream and downstream IP shocks. The experimental scaling is compared with the scaling predicted by the traditional Kolmogorov and by log-Poisson models taking into account intermittency. We produce the parameterization of scaling using She-Leveque-Dubrulle implementation of the log-Poisson model and reveal the difference in the level of intermittency. These levels can vary depending on many plasma agents, but generally, solar wind plasma shows the universal statistical properties not depending on a level of intermittency upstream and downstream IP shocks. The best agreement of experimental scaling is shown for the log-Poisson model with assumption of predominance of a filamentary geometry for singular dissipative structures.