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Magnetic discontinuities on small scales in MHD simulations and solar wind KAREEM OSMAN, Bartol Research Institute, Newark, Delaware, USA, ANTONELLA GRECO, Physics department University of Calabria, SERGIO SERVIDIO, Physics department University of Calabria Italy, WILLIAM H. MATTHAEUS, Bartol Research Institute and Department of Physics & Astronomy, University of Delaware, DE USA, PABLO DMITRUK, Departamento de Fi sica (FCEN-UBA), Buenos Aires, Argentina — Recent studies have compared properties of the magnetic field in simulations of MHD turbulence with spacecraft data, focusing on methods used to identify classical discontinuities and intermittency statistics. Comparison of solar wind data and simulations of 2D and 3D turbulence shows good agreement in waiting-time analysis of magnetic discontinuities, and in the related distribution of magnetic field increments. This supports the idea that the magnetic structures in the solar wind may emerge fast and locally from nonlinear dynamics that can be understood in the framework of nonlinear MHD theory. The analysis suggests that small scale current sheets form spontaneously and rapidly enough that some of the observed solar wind discontinuities may be locally generated, representing boundaries between interacting flux tubes. Some of these current sheets could be reconnection sites. Indeed, in turbulence strong reconnection events locally occur. Previous studies on discontinuities and theories of reconnection in turbulence could be combined in order to identify possible reconnection events between the intermittent events.

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