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A Statistical Analysis of Current Sheets in Turbulent MHD Simulations[1] VLADIMIR ZHDANKIN, University of Wisconsin-Madison, DMITRI UZDENSKY, University of Colorado-Boulder, JEAN PEREZ, University of Wisconsin-Madison and UNH, STANISLAV BOLDYREV, University of Wisconsin-Madison — The statistics of current sheets (CSs) in turbulent reduced-MHD simulations is analyzed in order to assess the importance of magnetic reconnection in the overall energy dissipation and to determine the dissipation intermittency in resistive MHD turbulence. An algorithm is developed for identifying CSs in 2D and 3D and for characterizing them quantitatively in terms of their energy dissipation, peak current density, length, and width. Statistical distributions of these quantities are found to have power-law tails. Furthermore, it is found that most CSs do not contain magnetic X-points and, vice versa, many X-points lie outside CSs. However, most of the strongest CSs do contain X-points and hence presumably are associated with reconnection. Their properties are compared with the Sweet-Parker theory.

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