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Non-linear Tearing of 3D Null Point Current Sheets PETER WYPER, GSFC, DAVID PONTIN, Dundee University — The manner in which the rate of magnetic reconnection scales with the Lundquist number in realistic three dimensional (3D) geometries is still an unsolved problem. It has been demonstrated that in 2D rapid non-linear tearing allows the reconnection rate to become almost independent of the Lundquist number (the "plasmoid instability"). Here we present the first study of an analogous instability in a fully 3D geometry, defined by a magnetic null point. The 3D null current layer is found to be susceptible to an analogous instability, but is marginally more stable than an equivalent 2D Sweet-Parker-like layer. Tearing of the sheet creates a thin boundary layer around the separatrix surface where efficient mixing of flux between the two topological domains occurs as the flux rope structures created during the tearing process evolve. This leads to a substantial increase in the rate of reconnection between the two domains.

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