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**Current sheets and reconnection at 3D null points**[1] D. PONTIN, A. BHATTACHARJEE, Space Science Center, University of New Hampshire, USA, K. GALSGAARD, University of Copenhagen, Denmark — The evolution of the magnetic field in the vicinity of a single isolated three-dimensional (3D) magnetic null point is discussed. Such 3D magnetic nulls may be important sites of magnetic reconnection in both solar coronal plasmas and the Earth's magnetosphere as well as some laboratory experiments. The formation of large current density at 3D nulls as a result of boundary driving is described. It is demonstrated by means of resistive MHD simulations that shear boundary perturbations which act to close up the angle between the null point spine and fan separatrices result in strong growth of the current density. Locally, the null point magnetic field collapses to form a 3D-localised current density structure, which has a Y-type appearance in the plane perpendicular to the boundary shear, resembling that of a Sweet-Parker current sheet. The qualitative and quantitative properties of the current sheet with respect to the driving parameters, the domain size, and the plasma parameters are discussed. Accompanying the current growth is the development of a significant component of the electric field parallel to the magnetic field. This parallel electric field is an indicator of the breakdown of ideal MHD, and of magnetic reconnection.

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A. Bhattacharjee
University of New Hampshire

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