THREE-DIMENSIONAL MAGNETIC RECONNECTION

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Three-dimensional reconnection is much more diverse than two-dimensional reconnection. In deed, the characteristics of these two types of reconnection are very different. For instance, three-dimensional reconnection can occur both in the vicinity of null points, as well as in the absence of null points. It occurs continuously and continually throughout a diffusion region, as opposed to at a single point, as it does in two dimensions. This means that in three-dimensions field lines do not reconnect in pairs of lines or even in sets of surfaces making understanding three-dimensional reconnection difficult. One important location for three-dimensional reconnection is at separators, special field lines that connect pairs of null points and lie along the intersection of the two separatrix surfaces emanating from the null points. By focussing on a series of three-dimensional resistive MHD experiments involving separator reconnection I reveal the local requirements and nature of reconnection along separators, as well as describing some of the global consequences of reconnection at multiple separators.

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