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Impulsive Reconnection in the Sun's Atmosphere[1] SPIRO ANTIOCHOS, NASA/GSFC — Recent high-resolution observations from the Hinode mission show dramatically that the Sun's atmosphere is filled with explosive activity ranging from chromospheric explosions that reach heights of Mm, to coronal jets that can extend to solar radii, to giant coronal mass ejections (CME) that reach the edge of the heliosphere. The driver for all this activity is believed to be 3D magnetic reconnection. From the large variation observed in the temporal behavior of solar activity, it is clear that reconnection in the corona must take on a variety of distinct forms. The explosive nature of jets and CMEs requires that the reconnection be impulsive in that it stays off until a substantial store of free energy has been accumulated, but then turns on abruptly and stays on until much of this free energy is released. The key question, therefore, is what determines whether the reconnection is impulsive or not. We present some of the latest observations and numerical models of explosive and non-explosive solar activity. We argue that, in order for the reconnection to be impulsive, it must be driven by a quasi-ideal instability. We discuss the generality of our results for understanding 3D reconnection in other contexts.

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Spiro Antiochos
NASA/GSFC

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