

Abstract Submitted
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Collision of an Arched Plasma-Filled Flux Rope with a Target Cloud of Initially Neutral Gas PAKORN WONGWAITAYAKORNKUL, PAUL M. BELLAN, Caltech — The Caltech solar loop experiment apparatus [1] had been used to create an arched plasma-filled flux rope that expands to collide with a pre-injected initially-neutral gas. We investigated such a situation in two regimes: (i) plasma made by heavy gas impacting a much lighter neutral gas cloud and (ii) a light-gas plasma impacting much heavier neutral gas. The neutral gas became ionized immediately upon impact. In regime (i), multiple shock layers were formed in the target cloud; these magnetized collisionless shocks are relevant to solar physics as such shocks develop ahead of Coronal Mass Ejections and occur in Co-rotating Interaction Regions. In regime (ii), plasma expansion was inhibited. In both cases, fast camera images, magnetic probe measurements, and spectroscopy data will be reported. The analysis of plasma and shock expansion, as well as associated density and temperature changes, will be presented.

[1] Stenson, E. V. & Bellan, P. M. 2012, Physical Review Letters, 109, 075001 (2012)

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