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Morphology and dynamics of three interacting flux ropes[1] BART VAN COMPERNOLLE, WALTER GEKELMAN, University of California, Los Angeles — The interaction of three flux ropes is studied in a laboratory magnetoplasma ($n_{background}$ = 2 10^{12} cm^{-3}, $n_{fluxrope}$ = 5 10^{12} cm^{-3}, Helium, B_{0z} = 330 G, plasma diameter = 60 cm). The ropes are made using a 8 cm diameter Lanthanum Hexaboride (LaB_6) cathode and remote anode, 11 m away. Each rope carries 30 A of current and produces magnetic fields on the order of a few % of B_{0z}. Volumetric magnetic field data was acquired and the magnetic field structure and dynamics of the flux ropes can thus be reconstructed. The flux ropes are found to propagate at the Alfvén speed. Merging and bouncing of the flux ropes has been observed. The ropes twist and writhe as they propagate through the plasma. They are line tied and clearly separate at the cathode end but further away they merge into one extended rope. The steady state of the flux ropes is characterized by a rotation of the three flux ropes as a whole. At the same time the flux ropes are twisting around each other. Time resolved density and temperature measurements from Langmuir probe data show increases by a factor of two in local electron temperature and electron density due to the presence of the ropes. These local increases in density and temperature are associated with the location

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