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Dual gas laboratory coronal loops EVE STENSON, PAUL BELLAN, Caltech — Solar coronal loops are arched plasma structures that protrude from the Sun's photosphere into its corona, some extending hundreds of thousands of kilometers. These structures exhibit a ubiquitous axial uniformity; it has been proposed that this is due to convection of toroidal flux. Their behaviors include filamentation of the current channel, expansion of the arch, formation of helical twists, and eruption. These features have all been observed in laboratory simulations of coronal loops, created with a magnetized plasma gun. Both single loops and pairs of loops have already been studied in detail. Until now, however, each experiment used only one gas. This can make it difficult to resolve the details of processes whereby different portions of the plasma merge. By incorporating a second gas into the laboratory coronal loops, this investigation seeks a clearer understanding of how these plasmas evolve and interact. For a single loop experiment, a different gas can be used at each of the two footpoints, highlighting convection processes and interactions at the apex. Additionally, two adjacent loops can be formed using two distinct gases, elucidating the manner in which they merge.

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