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Experimental and computational study of plasma bullet reignition behind a thin dielectric slab PIETRO RANIERI, NATALIA BABAEVA, JOHN FOSTER, University of Michigan — Ionization waves (IWs) propagating through plasma jets and helium channels are often observed as luminous fronts of the IWs and conventionally termed as plasma bullets. The preliminary experiments show that if a thin dielectric slab is placed in the helium channel as an obstacle for the bullet propagation, the discharge may reignite below the slab. This process is perceived as though the bullets propagate through the obstacle. The goal of this work is to find conditions under which the bullet can reignite behind the dielectric. The experimental setup consists of a corona discharge, with a single metal electrode, within a quartz tube. We study the influence of the dielectric constant, thickness and the length of the mica slab on the plasma jet behavior. We show that after the impact on the mica surface, the bullet partially reflects from the surface and plasma spreads along the surface. Depending on the location of the mica relative to the tube exit, its capacitance and opacity to photoionizing radiation, a second bullet can emerge below the slab. The computational model used in this work, *nonPDPSIM*, is a plasma hydrodynamics model in which continuity, momentum and energy equations are solved for charged and neutral species with solution of Poisson's equation for the electric potential.

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