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Physical properties of colliding microplasma bullets CLAIRE DOUAT, GÉRARD BAUVILLE, MICHEL FLEURY, VINCENT PUECH, Laboratoire de Physique des Gaz et des Plasmas CNRS and Univ. Paris Sud, Orsay, France, MOUNIR LAROUCSI, Laser and Plasma Engineering Institute, Old Dominion University, Norfolk, Virginia 23529, USA — Cold plasma jets produced by pulsed discharges have recently attracted attention because of their physical properties enabling the development of new applications, such as plasma medicine. ICCD pictures of these jets revealed that they were composed of plasma bullets propagating at high velocity. When two plasma bullets interact in two counter-propagating helium flows surrounded by ambient air, a secondary bullet is produced as shown in [1]. But, when the two bullets are produced within only one gas flow, a transient pink glow is observed, in between the two plasma bullets, a few nanoseconds after their complete collapse. The size and the location of this glow exactly correspond to the area free of previous bullet propagation. Based on time-resolved spectroscopic investigation, correlations between this transient glow and the well-know pink after-glow of nitrogen will be discussed.

[1] C. Douat, M. Fleury, M. Laroussi, and V. Puech, IEEE Trans. Plasma Sci. To be published 2011, DOI 10.1109/TPS.2011.2109740

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