

Abstract Submitted
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Development of a multipass cell for atomic collision experiments in the presence of a laser field¹ N. ST.J. BRAITHWAITE, The Open University, UK, B.A. DEHARAK, Illinois Wesleyan University, USA, N.L.S. MARTIN, The Open University, UK and University of Kentucky, USA, A.J. MURRAY, K.L. NIXON, University of Manchester — Experiments on electron-impact ionization in the presence of a pulsed laser field are currently being carried out at the Universities of Manchester, UK and Kentucky, USA. The experiments are difficult because, with a typical laser pulse length of a few nanoseconds and a repetition rate of order 10 Hz, the live time is equivalent to a few seconds per year. In order to increase the effective live time, one possible approach is to create a “multipass cell” in which a laser pulse is passed several times through the interaction region. A scheme will be presented which uses spherical or parabolic mirrors to create a non-repetitive path which passes through the interaction region many times before being guided out of the cell. The pulse may then either be dumped or passed through a regenerative amplifier (thus allowing for any losses in the cavity), and then re-injected into the original path, so as to increase the interaction time by several orders of magnitude.

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