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Double- Ionization of Ar and Ne in Colors ALI S. ALNASER, Physics Department-American University of Sharjah, UAE, D. COMTOIS, INRS-Énergie, Matériaux et Télécommunications, Varennes, Québec, Canada, A.T. HASAN, Physics Department-American University of Sharjah, UAE, D.M. VILLENEUVE, National Research Council of Canada, Ottawa, Canada, J.-C. KIEFFER, NRS-énergie, Matériaux et Télécommunications, Varennes, Québec, Canada, I.V. LITVINYUK, D.J.R. Macdonald Laboratory, Physics Department, Kansas State University, USA — We have conducted a systematic study on the double ionization of Ar and Ne atoms to investigate the origin of the dip in the longitudinal momentum distribution of the doubly-charged recoil ions. We used a wide range of wavelengths (483, 800, 1313, 2016 nm) and laser peak intensities. The momentum distributions of the doubly-charged recoil ions in the direction parallel to the laser polarization were measured with sufficiently high resolution. At 800 nm, Ne^{2+} exhibits a pronounced dip around zero momentum, while Ar^{2+} shows a shallow one. When using the longer wavelengths (1313 and 2016 nm) the dip in the momentum distribution of both ions becomes very distinct, while with the shorter wavelengths the dip gets much shallower in Ne^{2+} and almost disappears in Ar^{2+}. Our results indicated that the origin of the dip is *principally* due to the interplay between the maximum energy gained by the rescattering electron in the laser field and the ionization potential of singly- charged ion.

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