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Formation of ultrashort pulses from monochromatic XUV radiation via interaction with a medium of IR-dressed He atoms. TIMUR AKHMEDZHANOV, Texas A&M University and Institute for Quantum Studies and Engineering, College Station, TX, VLADIMIR ANTONOV, Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, Russia, OLGA KOCHAROVSKAYA, Texas A&M University and Institute for Quantum Studies and Engineering, College Station, TX — Trains of high intensity ultrashort XUV pulses could find a lot of applications. Recently, a mechanism of high efficiency formation of a train of XUV pulses from quasi-monochromatic XUV field was suggested [Opt. Lett. 36, 2296 (2011)]. XUV field propagates through the medium of atoms, which are space-time modulated by IR field. The field scattered by modulated atoms contains sidebands of incident XUV field frequency and, for properly chosen parameters, train of ultrashort pulses is formed at the output of the medium. In this contribution, we study formation of ultrashort pulses in the medium of He atoms. Contrary to our recent work [Phys. Rev. A 91, 023830 (2015)], IR field is chosen to be weak enough, so that pulses are formed due to modulation of excited atomic levels, rather than tunnel ionization. The suggested method allows to form train of pulses with high efficiency and can be scaled to He-like ions in order to get even shorter pulses.

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