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**Formation of a single attosecond pulse from the resonant XUV radiation on a steep front edge of a strong IR field** TIMUR AKHMEDZHANOV, Department of Physics and Astronomy, 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, Department of Physics and Astronomy, Texas A&M University and Institute for Quantum Studies and Engineering, College Station, TX — Formation of isolated attosecond pulses is one of the key aims of modern optics. Such pulses with the carrier frequency below the threshold of atomic ionization would provide a tool for studying ultrafast bound dynamics of atoms and molecules. Recently, a mechanism to form a single attosecond pulse from an incident XUV radiation via abrupt interruption of its resonant interaction with hydrogenlike atoms on a steep front edge of a strong IR field was proposed [Phys. Rev. Lett. 110, 213903 (2013)]. If the front edge of the IR field is steep enough, the atoms, essentially unaffected by the IR field during one half-period, can be completely ionized during subsequent half-period of the IR field. Thus, the transient multifrequency atomic response to the XUV radiation is limited to an ultrashort time interval, providing the possibility for attosecond pulse formation. In this contribution, we present the results of solution of time-dependent Schrodinger equation for He atoms simultaneously irradiated by the resonant XUV field and a pulse of strong IR field with steep front edge, which show the possibility to form an isolated attosecond pulse with duration on the order of few hundred attoseconds under the experimentally feasible conditions.

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