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Photoionization and photocurrents at sub-field-cycle temporal scale PETER ZHOKHOV, ALEKSEI ZHELTIKOV, Physics & Astronomy Dept., Texas A&M University — The Keldysh theory of photoionization in solids is generalized to the case of arbitrarily short driving pulses of arbitrary shape and polarization. We derive a closed-form solution for the nonadiabatic ionization rate and field-driven currents in the solid-state electron-hole plasma. Our results indicate important role of ultrafast photoionization dynamics within the field cycle and link the ultrafast photoionization dynamics with experimentaly accessible quantities.

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