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Optical breakdown criterion for single-cycle laser pulses PETER ZHOKHOV, ALEKSEI ZHELTIKOV, Physics & Astronomy Department, Texas A&M University — The Keldysh theory of photoionization in solids is generalized to the case of arbitrarily short driving pulses of any shape or polarization. We derive a closed-form solution for the nonadiabatic ionization rate and field-driven currents in the solid-state electron-hole plasma. Using this framework, we propose a new criterion for optical breakdown of solids that depends on the pulse shape and is applicable to laser pulses as short as a single optical cycle.

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