

Abstract Submitted
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Nonlinear optical response and ionization of a metal tip plasmon in ultrafast strong fields SHAWN PERDUE, Univ of California - Irvine, JOON-HEE LEE, DESIRE WHITMORE, ALEJANDRO RODRIGUEZ PEREZ, V. ARA APKARIAN, CHEMISTRY AT THE SPACE-TIME LIMIT (CASTL) TEAM — The nonlinear response of a silver tip plasmon is investigated by simultaneously measuring its optical response and field induced ionization current. The measurements rely on interferometric cross-correlation of frequency-modulated optical pulse trains. The method allows for a quantitative analysis of the plasmon nonlinear optical susceptibilities, and a unique interpretation of the ionization process as field induced tunneling. Nonlinear optical mixing up to the 4th harmonic of the Ti:Sapphire fundamental is observed by detecting electron current, demonstrating an electron pulse train of 600 attosecond period. The electron pulse train results from the detachment of the strongly modulated plasmon tail.

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