

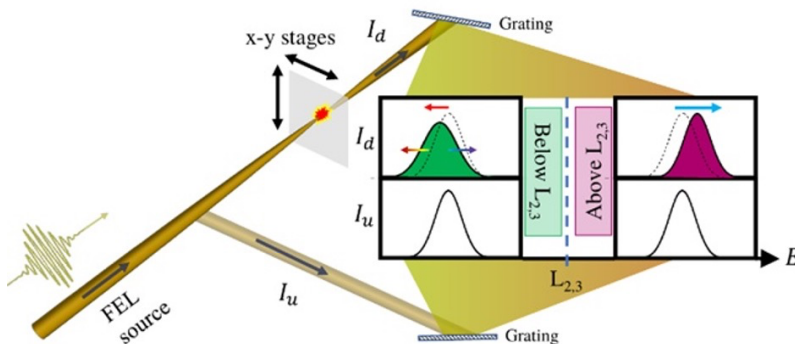
Self-driven third order nonlinear effects from the visible to the extreme ultraviolet

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Abstract: Self-driven third order nonlinear effects represent a key element for the realization of several optical spectroscopies and photonic devices. By the simple interaction between one pulse and matter, they can induce spectral modifications, such as supercontinuum generation, wavelength converters, and chirped pulse amplification. The recent advent of Free Electron Lasers (FEL) and high-harmonic generation (HHG) systems enables the extension of these effects in the wavelength regime of X-ray and Extreme ultraviolet (EUV) and the realization of new spectroscopic schemes taking advantage of the shorter wavelength involved. No evidence for intrapulse dynamics, however, has been reported at such short wavelengths, where the light-matter interactions are ruled by the sharp absorption edges of core electrons. We will show the first experimental evidence for self-phase modulation of



femtosecond seeded FEL pulses in EUV [1].

[1] C. Ferrante et al., Light Sci. Appl. 10, 92 (2021)