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Title: Coherent Emission from ultraintense laser thin foil interactions

Abstract:

Several processes can lead to the emission of coherent XUV emission in laser solid foil interactions – most notably to date Relativistic Oscillating Mirror (ROM) and Coherent Wake Emission (CWE). Under the correct interaction conditions, the electrons driven by the laser-field form nano-bunches which can radiate in the XUV via a process very similar to synchrotron emission. The small scale of the electron bunches allows the synchrotron like emission to be coherent. Here we observe and theoretically investigate such a synchrotron-like mechanism in the transmitted laser direction for the first time. Coherent XUV emission with low divergence and synchrotron like scaling is observed experimentally and discussed theoretically.