

# Experimental Measurements of Electron-Bunch Trains in a Laser-Plasma Accelerator

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Spectral measurements of visible coherent transition radiation produced by a laser-plasma-accelerated electron beam are reported. The significant periodic modulations that are observed in the spectrum result from the interference of transition radiation produced by multiple bunches of electrons. A Fourier analysis of the spectral interference fringes reveals that electrons are injected and accelerated in multiple plasma wave periods, up to at least 10 periods behind the laser pulse. The bunch separation scales with the plasma wavelength when the plasma density is changed over a wide range. An analysis of the spectral fringe visibility indicates that the first bunch contains most of the charge.

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