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Studies of spectral modification in LWFA and filament formation<sup>1</sup> WENXI ZHU, JOHN PALASTRO, THOMAS ANTONSEN, IREAP, University of Maryland College Park — Intense short laser pulses propagating in nonlinear media suffer spectral modification. For example, in laser wake field acceleration (LWFA) the pulse spectrum is modified by the presence of a large amplitude plasma wave. In the case of pulse propagation in air the spectrum is modified by the nonlinear response and initialization of the air molecules. The laser pulse is modeled (as in WAKE) using the envelope approximation, which assumes the spectrum is narrow. In practice the spectrum can be broad. Here we investigate limitations to and extensions of the envelope approximation in the modeling of LWFA and filament formation in air.

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