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Self-focusing instability of stochastic laser pulses[1] VLADIMIR MALKIN, NATHANIEL FISCH, Princeton University — The propagation of coherent laser pulses through plasmas and other focusing Kerr-like media is known to be limited by the transverse filamentation instability, occurring at powers exceeding the so-called "critical power of self-focusing." It appears, however, that the self-focusing instability threshold for stochastic laser pulses might be much higher than for coherent laser pulses. Furthermore, the instability of over-threshold stochastic pulses might develop much slower than the instability of coherent pulses of the same intensity. These effects might be used advantageously to suppress the transverse filamentation instability of amplified pulses in ultra-powerful plasma-based backward Raman amplifiers.

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