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Exploiting the self-similar nature of Raman and Brillouin amplification R. TRINES, Rutherford Appleton Laboratory, Didcot, UK, E.P. ALVES, R.A. FONSECA, L.O. SILVA, IST Lisbon, Portugal, E. WEBB, Rutherford Appleton Laboratory, Didcot, UK, F. FIUZA, SLAC, R.A. CAIRNS, University of St Andrews, UK, R. BINGHAM, P. NORREYS, Rutherford Appleton Laboratory, Didcot, UK — Raman and Brillouin amplification are two schemes for amplifying and compressing short laser pulses in plasma. Depending on the laser and plasma configurations, these schemes could potentially deliver the high-energy high-power pulses needed for inertial confinement fusion, especially fast-ignition fusion. Analytical self-similar models for both Raman and Brillouin amplification have already been derived, but the consequences of this self-similar behavior are little known and hardly ever put to good use. In this talk, we will give an overview of the self-similar laws that govern the evolution of the probe pulse in Raman and Brillouin amplification, and show how these laws can be exploited, in particular regarding the parameters of the initial probe pulse, to control the properties of the final amplified probe and improve the efficiency of the process.

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