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Plasma-based laser-pulse amplification via strongly coupled Brillouin scattering MARCO CHIARAMELLO, FRANÇOIS AMIRANOFF, LULI, Université Pierre et Marie Curie - Ecole Polytechnique - CNRS - CEA, 75252 Paris, STEFAN WEBER, ELI-Beamlines, Institute of Physics of the Academy of Sciences, 18221 Prague,Czech Republic, LIVIA LANCIA, SAPIENZA, University of Rome, Dip. SBAI, 00161 Rome, Italy, MICHAEL GRECH, TOMMASO VINCI, JEAN-RAPHAEL MARQUÉS, JULIEN FUCHS, CATERINA RICONDA, LULI, Université Pierre et Marie Curie - Ecole Polytechnique - CNRS - CEA, 75252 Paris, LULI, UPMC - ECOLE POLYTECHNIQUE - CNRS- 75252 PARIS TEAM, ELI-BEAMLINES, IPAS, 18221 PRAGUE,CZECH REPUBLIC COLLABORATION, SAPIENZA, UNIVERSITY OF ROME, DIP. SBAI, 00161 ROME, ITALY COLLABORATION — The use of plasma as an amplification medium for laser pulses is currently discussed because it can overcome current solid-state technology limitations in terms of maximum achievable intensity. Via parametric scattering off a plasma oscillation the energy from a long pump pulse can be transferred into a short seed pulse. Brillouin scattering has the potential to become a robust amplification process. In this presentation we will show theoretical and numerical (PIC) studies aimed at better understanding the role on the amplification mechanism of each plasma parameter, such as the interaction length, the shape of the density profile, the duration of the long pump signal, the relative delay between the seed and pump signals, the role of the chirp of the long pump laser pulse. Comparisons with recent experiments will be performed.

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