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Experimental investigation of short light pulse amplification using stimulated Brillouin backscattering[1] LIVIA LANCIA, JEAN-RAPHAËL MARQUÈS, JULIEN FUCHS, CATERINA RICONDA, ANA MANCIC, PATRIZIO ANTICI, PATRICK AUDEBERT, MOTOAKI NAKATSUTSUMI, LULI, France, STEFAN WEBER, VLADIMIR T. TIKHONCHUK, CELIA, France, STEFAN HUELLER, JEAN-CLAUDE ADAM, ANNE HÉRON, CPhT, France — Efficient light amplification using stimulated Brillouin backscattering (SBS) in the strongly coupled regime has been predicted by numerical simulations. We experimentally investigated this regime by coupling two counter-propagating short pulses (a pump beam [0.4-30 ps, $\sim 10^{16}$ W.cm^{-2}] and a seed beam, [400 fs, $\sim 10^{15}$ W.cm^{-2}]), both at a wavelength 1.057 μm, in a preformed plasma. Diagnostics included energy and spectra of the transmitted pump and seed, and of the backscattered pump, as well as the duration of the transmitted seed. The spatio-temporal coherence of the transmitted pump (without seed) has been detected in order to gain insight in the SBS mechanism in this regime. Detailed results will be presented as a function of the plasma density, the ion species composing the plasma, and the polarisations of the pump and seed.

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