Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Laser and Plasma Parameters for Laser Pulse Amplification by Stimulated Brillouin Backscattering in the Strong Coupling Regime THOMAS GANGOLF, MARIUS BLECHER, ILPP, Heinrich-Heine-Universitaet Duesseldorf, SIMON BOLANOS, LIVIA LANCIA, JEAN-RAPHAEL MARQUES, LULI, Palaiseau, MIRELA CERCHEZ, RAJENDRA PRASAD, BASTIAN AURAND, ILPP, Heinrich-Heine-Universitaet Duesseldorf, PASCAL LOISEAU, CEA, Arpajon, JULIEN FUCHS, LULI, Palaiseau, OSWALD WILLI, ILPP, Heinrich-Heine-Universitaet Duesseldorf — In the ongoing quest for novel techniques to obtain ever higher laser powers, plasma amplification has drawn much attention, benefiting from the fact that a plasma can sustain much higher energy densities than a solid state amplifier. As a plasma process, Stimulated Brillouin Backscattering in the strong coupling regime (sc-SBS) can be used to transfer energy from one laser pulse (pump) to another (seed), by a nonlinear ion oscillation forced by the pump laser. Here, we report on experimental results on amplification by sc-SBS using the ARCTURUS Ti:Sapphire multi-beam laser system at the University of Duesseldorf, Germany. Counter-propagating in a supersonic Hydrogen gas jet target, an ultrashort seed pulse with a pulse duration between 30 and 160fs and an energy between 1 and 12mJ was amplified by a high-energy pump pulse (1.7ps, 700mJ). For some of the measurements, the gas was pre-ionized with a separate laser pulse (780fs, 460mJ). Preliminary analysis shows that the amplification was larger for the longer seed pulses, consistent with theoretical predictions.

Thomas Gangolf
ILPP, Heinrich-Heine-Universitaet Duesseldorf

Date submitted: 21 Jul 2017 Electronic form version 1.4