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Exploring the physics of compressible Kelvin-Helmholtz Instability in magnetized laser-produced plasma. VICTORIEN BOUFFETIER, ALEXIS CASNER, LUKE CEURVORST, Centre Lasers Intenses et Applications, Universit de Bordeaux, HONG SIO, Lawrence Livermore National Laboratory, JONATHAN PEEBLES, Laboratory for Laser Energetics, VLADIMIR SMALYUK, OMAR HURRICANE, Lawrence Livermore National Laboratory — The Kelvin-Helmholtz Instability (KHI) is a key mechanism responsible of energy transfer from the large fluid scales to the kinetic scales. The instability is present in numerous systems such as stellar physics in the study of coronal mass ejections in solar flares to the Earth's magnetosphere reconnection physics for example. Due to the complexity of this phenomenon, the study of the KHI in a controlled way appears necessary to obtain a better understanding of its development. The stabilizing effect of applied magnetic field on KHI is well known since Chandrasekhar's seminal book, but no experimental benchmarks have been made under intense magnetic fields. The case of compressible magnetized KHI is even unexplored and is then of interest. We propose here to present an experimental design and MHD simulations performed with the FLASH code [1] for the study of the compressible KHI when an intense magnetic field is applied. The presented framework will be experimentally tested on OMEGA laser facility.
[1] P. Tzeferacos et al, Physics of Plasmas, 24(4):041404, 2017

Victorien Bouffetier
Centre Lasers Intenses et Applications, Universit de Bordeaux

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