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Plasma Jet and Shock Experiments Using High-Power Lasers YOUICHI SAKAWA, A. OYA, S. DONO, T. KIMURA, N. OZAKI, Y. KU-RAMITSU, T. KATO, H. NAGATOMO, K. SHIGEMORI, R. KODAMA, T. NORI-MATSU, H. TAKABEA, ILE, Osaka Univ., JAPAN, B. LOUPAIS, M. KOENIG, LULI, Ecole Polytechnique, France, J. WAUGH, N. WOOLSEY, Dept. of Physics, York Univ., UK — We investigate laboratory laser-plasma experiments to address questions connected to the formation and collimation of astrophysical jets and shock waves. In particular, we plan to scale our experiments to non-relativistic jets associated with Young Stellar Object. Experiments were performed with Gekko / HIPER laser system (3w, 500 ps, 300 - 750 J, $< 10^{15}$ W/cm²) at ILE, Osaka Univ. Several types of targets were used; 10 μ m thick plane or 600 μ m diameter hemisphere CH shell targets with an Au-cone, foam-filled cone targets targets, and hemisphere CH. These targets were used to create plasma jets. In order to produce a shock wave, a He gas jet system was placed on the bottom on the vacuum chamber. The plasma jet and shock were measured with a Mach-Zender interferometry diagnostic, using a probe laser pulse in the transverse direction; an ICCD camera with 200 ps gate time and a S1 streak camera were used. As rear-side diagnostics of self-emission, we used HISAC and SOP for time-evolution measurements of 2-D self-emission profile and temperature, respectively. In all types of the targets, clear jets were observed.

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