HIGH ENERGY DENSITY PHYSICS AND ION-BEAM PLASMA INTERACTION BASED ON LARGE SCALE HEAVY ION ACCELERATORS IN CHINA

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A large scale scientific research platform, named High Intensity heavy-ion Accelerator Facility (HIAF), was proposed as one of the projects for basic sciences and technologies of the 12th 5-year-plan in China. It will be a lab opening to the outside world, offering additive opportunity for investigating the high energy density (HED) physics and the basic techniques for Inertial Confinement Fusion (ICF) driven by intense heavy ion beam. As shown in Figure 1, the high ion beam intensity would be as high as 10^12 ppp/mm^2, and the terminals for HEDP research would contain a high energy electron beam line and an ion beam line for radiographic diagnostics and particle-plasma interaction studies, in addition to the main pulse for creation of HED.

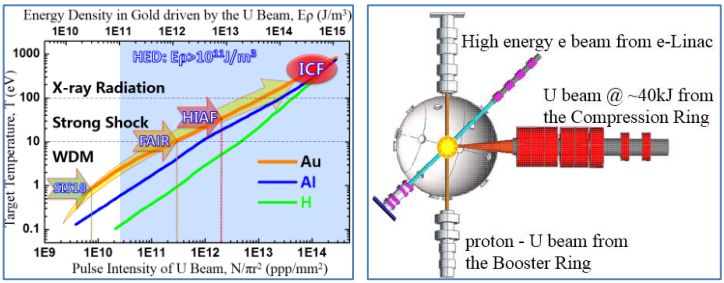

Fig.1 HIAF will offer an additive opportunity to the HEDP community

In addition, we would like to report the progress on the investigation of the energy loss of hundreds keV/u proton and helium beams after passing a gas-discharged plasma target. Figure 2 shows the experimental result for 400keV helium beam penetrating the hydrogen plasma target (with initial gas pressure of 1-8mbar, and discharging high-Voltage of 3kV) in terms of time after discharging.

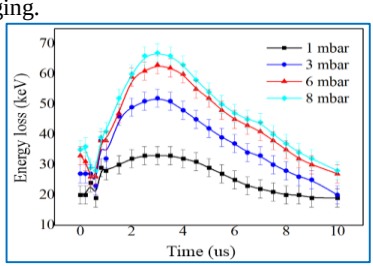

Fig.2 Energy loss of 400keV He in plasma with different initial gas pressure

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References

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