



Contribution ID: 115

Type: **Poster presentation**

Production of Proton Beam with ZrH_2 Pellet Target

Wednesday 18 October 2017 18:45 (15 minutes)

We have been developing on proton beam generation with a Laser ion Source (LIS). A LIS has its uniqueness in providing various species of ion beams only by changing solid material target which is irradiated by high intensity pulsed laser. The methods to provide heavy ion beams such as Au or Fe solid target were already established, but there has been no attempt to produce proton beam with LIS. To generate proton beam with LIS, solid materials which generate proton beam are required. Conventionally, proton beam is provided with ion sources using gaseous hydrogen. In the past [1], we confirmed proton generation from a LIS with metal hydride targets. This time, we installed a pellet target made of ZrH_2 powder in the LIS and successfully observed proton beam current of 120 μ A which was obviously distinguishable from Zr ion beam current. In this presentation, we will give more details on this experiment.

References

[1] M. Okamura et. al., Rev. Sci. Instrum. 87, 02A906 (2016).

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Session Classification: Poster Session 3

Track Classification: Applications and related technologies