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Charge State Dependence in Increase of Ion Beam Current from Laser Ion Source by Applying Solenoidal Magnetic Field

Applying a solenoidal magnetic field to a laser produced plasma is a method to increase the ion beam current supplied from a laser ion source. The purpose of this study is to investigate the ion charge state dependence of the beam current increase in the laser ion source by applying a solenoidal magnetic field. The plasma generated by a Nd:YAG laser was injected into a magnetic field generated by a solenoid coil with length of 30 mm. The current waveforms of the ion beam extracted from plasmas were measured as a function of the magnetic flux density for the solenoidal field. In addition, the beam current waveforms at each charge state were analyzed by magnetic deflection. Based on the beam current for total ions and one for each charge states, we will discuss the ion charge state dependence in multiplication factor of ion beam current by applying the solenoidal magnetic field.

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Yes

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