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Evaluation of H-/D- Density Using Langmuir Probe Measurement in a Cs Seeded Negative Ion Source

Negative-ion density measurement in negative-ion sources is still in demand for improving the design and efficiency of the sources [1,2].

A new analysis method called the 'electron reduction Langmuir probe model' is developed for an area that cannot use a laser-related measurement [3], such as inside the extraction hole.

A validity check of the new analysis is performed in hydrogen and deuterium plasma for utilizing and improving the technique.

Langmuir probe-assisted photodetachment [4,5,6] calibrated with cavity ring down line integral [7] is a standard for negative ion density.

A linear correlation between negative ion density from the electron reduction method and the standard shows that the new analysis method can be a replacement with careful calibration.

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