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Characterization of a Cs-free Negative Hydrogen Ion Source System Using Multi-Pulsed Plasma Sources

A cesium-free negative hydrogen/deuterium ion source system using two pulsed plasma sources has recently developed at Korea Atomic Energy Research Institute. The system operates with two alternate pulsing sequences related to the respective plasma sources, thereby switching the plasmas in the after-glow state in an alternating manner. As a result, the ion source system can offer a continuous supply of negative ions at high densities. This is not possible with conventional single pulsing. In order to understand the physics of the ion source system, in this study, the negative ion behavior in the system is experimentally investigated and then compared with that in a single pulsing mode. For experiments, time-resolved Langmuir probe and laser photodetachment diagnostic techniques are employed. In this presentation, experimental results and analysis will be presented and discussed in detail.

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