



Contribution ID: 43

Type: **Poster presentation**

Contribution of Atomic Hydrogen Flux on H^- Ion Beam extracted from a Negative Hydrogen Ion Source

Monday 16 October 2017 18:45 (15 minutes)

Contemporary negative hydrogen (H^-) ion sources are operated with Cs ovens, and some part of the H^- ion current extracted from the source is believed produced at the surface of the biased plasma electrode. The principle mechanism of the H^- ion current production can be due to the reflection of atomic hydrogen, but this hypothesis has not been directly confirmed in the actual ion source operating condition yet. An atomic hydrogen source is attached to a multicusp type H^- ion source to see the effect upon the extracted negative ion current. The atomic beam source produces hydrogen beams of low temperature atoms by inductively exciting a plasma in a dielectric capillary tube. The source plasma parameters are measured with a Langmuir probe, and several laser based diagnostic methods. The information on Cs coverage is integrated to distinguish the role of plasma surface interaction on H^- production from the source.

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Session Classification: Poster Session 1

Track Classification: Negative ion sources