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## Experimental Study on Dynamic Effects of $H^-$ and $D^-$ Negative Ions in an ECR-Plasma Source

The electrostatic probe-based photodetachment technique with one or two laser beams can provide insight on the negative ion absolute densities or even dynamics, respectively, in electronegative plasmas. In this work, this diagnostic is installed in the ECR-driven (2.45 GHz) source “Prometheus I” and numerous details of the setup design along with the underlying physics are discussed for its proper application. The role of sensible experimental considerations in avoiding signal distortion and erroneous interpretation of the results is demonstrated. Based on these observations,  $H^-$  and  $D^-$  negative ion densities and energies are measured in the above source in a reliable manner. The experiments are carried out throughout the available range of the operational parameters, i.e. the pressure and total power vary between 1 –20 mTorr and 0 –900 W, respectively.

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