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Modeling of Hydrogen Negative Ions in Sheet Plasma HIROYASU KOMUKAI, AKIRA TONEGAWA, TAKASHI TORADA, TOMOCHIKO ONO, KAZUTAKA KAWAMURA, Tokai Universtiy, TONEGAWA LAB. TEAM — Hydrogen negative ions (H^-) are formed by the dissociative attachment of low-energy electrons (T_e ~1 eV) to highly vibrationally excited molecules H_2*(v">5), which are attributed to the electron-impact excitation of molecules by high- energy electrons (T_e >15 eV) in the plasma. In order to produce negative ions in plasmas, we have designed a system of a magnetized sheet plasma crossed with a vertical gas flow. The magnetized sheet plasma is suitable for the production of negative ions, because the electron temperature in the central region of the plasma is as high as 10 -15 eV, whereas in the periphery of the plasma, a low temperature of 1 eV is obtained. We have carried out the modeling of hydrogen negative ions taking into account of vibrationally excited hydrogen molecules in hydrogen plasma. H^- ions are localized in the periphery region where there are low energy electron from the edge of the sheet plasma. A zero-dimensional model based on available rate coefficients was found to predict the observed dominant ion densities.

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