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A Study on the Plasma Condition for Design of Neutralizer with High Neutralization Efficiency[1] JANG-JAE LEE, SIJUN KIM, YOUNGSEON LEE, SEUNGWAN YOO, CHULHEE CHO, SHINJAE YOU[2], Applied Physics lab for PLasma Engineering (APPLE), Department of Physics, Chungnam National University — Plasma neutralization is used for high-energy neutral beam injection into fusion plasma. It is necessary to optimize the plasma source used for the neutralizer in order to improve the neutralization efficiency. In this study, plasma condition for improving the neutralization efficiency of negative ion beam (H-) in hydrogen plasma were investigated. The plasma neutralization efficiency was calculated using differential equations of beam fraction. To calculate the differential equations, density of target species in plasma which are derived from a global model, and cross sections which are dependent on the relative speed between colliding particles, such as beam particle and electron, were used. The dependence of neutralization efficiency of negative ion beam in the hydrogen plasma on electron density, electron temperature, and pressure were investigated.

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