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## Study of Neutral Hydrogen Transport in LHD Core Plasmas Based on High Dynamic-Range Balmer-Alpha Spectroscopy

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The radial distribution of the neutral hydrogen atom density ( $n_H$ ) and pressure ( $P_H$ ) in the Large Helical Device (LHD) is studied. The  $n_H$  distribution is determined from a detailed analysis of the intensity-calibrated Balmer-alpha line profile while the  $P_H$  distribution is obtained with a simple one-dimensional analytical model. We have for the first time determined  $n_H$  at the center of a fusion-oriented plasma, which is approximately three orders smaller than that at the edge. On the contrary,  $P_H$  changes only a factor of 10 from the edge to core regions. The central  $n_H$  has a tendency to become smaller as the line-averaged electron density is increased.

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Japan

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