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Z_{eff} profiles from visible bremsstrahlung measurements on HL-2A

L. Liu, D. L. Yu, X. X. He, W. J. Chen, J. Wang, Z. C. Yang and the HL-2A team
Southwestern Institute of Physics, P. O. Box 432, Chengdu 610041, China

The effective charge (Z_{eff}) profiles are measured on HL-2A tokamak under different discharge conditions, such as Ohmic and auxiliary heating discharges, L-H mode transition and impurity injections. Z_{eff} is usually calculated using data from line integrated bremsstrahlung measurements, electron density and temperature profiles, and the plasma geometry. It is an important parameter for the impurity control in high temperature plasma. The line integrated bremsstrahlung profiles are achieved with the spatial resolution of 1 cm on HL-2A tokamak. Light-absorption panels that face the telescope are installed on the inner vessel wall, aiming at reducing the influence of wall reflection on the bremsstrahlung measurements. High-resolution spectrometer is used to select the impurity-line free region instead of interference filters, owing to the fact that in discharges with impurity injection or auxiliary heating power injection, some unpredicted impurity lines may invade this region, giving rise to a deviation of profile measurements. It is found that Ohmic discharges show a center-peaked profile shape with a local radiation-enhanced region in the vicinity of r=26cm, of which the radiation intensity increases after a NBI power of 8 ms duration. In addition, Z_{eff} is higher in NBI discharge than in Ohmic discharge.