L- and H-mode scenario prediction based on NBI of NCST

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Abstract

The negative triangularity(NT) can effectively improve the core confinement ability. The tokamak NT experiment proves that the low confinement mode without ELM can achieve the confinement performance of the high confinement mode under the corresponding positive triangularity(PT). The L-mode under NT with neutral beam injection achieves the same electron and ion temperatures^{1,2}, which indicates that the NT still provides sufficient confinement enhancement when the microscopic instability of the core is not completely dominated by TEM³. NT discharge has been less studied in spherical tokamak. The injection geometry of the NBI is optimized in different configurations to maximize deposition and current drive and avoid excessive losses. The confinement ability of the device to fast ions is analyzed by modeling the ripple of the device. The possibility based on NBI negative triangularity L-mode and positive triangularity H-mode operation is explored. This will contribute to understanding the confinement properties and potential advantages of spherical tokamak.

Keywords: negative triangularity, L- and H-mode, NBI

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