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Effect of edge turbulent transport on scrape-off layer width on HL-2A tokamak

T. Wu¹, M. Xu¹, L. Nie^{1*}, J. Q. Xu¹, Y. Yu^{1,2}, T. Long¹, Y. He³, J. Cheng³, L. W. Yan¹, Z. H. Huang¹, R.

Ke¹, P. Shi¹, S. Wang¹, B. Liu³ and X.R. Duan¹

¹Southwestern Institute of Physics, Chengdu 610041, People's Republic of China

²School of Physics, University of Science and Technology of China, Hefei 230026, People's Republic of China

³Institute of Fusion Science, School of Physical Science and Technology, Southwest Jiaotong University, Chengdu 610031, People's Republic of China

*Email of corresponding author: nielin@swip.ac.cn

Abstract

Effect of edge turbulent transport on scrape-off layer (SOL) width has been investigated in Ohmic heated plasma under limiter configurations on HL-2A tokamak. It has been found that SOL width is doubled when plasma current decreases about 20%. With larger plasma current, $\mathbf{E} \times \mathbf{B}$ shear is stronger and has greater suppression effect on edge turbulent transport. Edge turbulent transport, as a non-local effect, plays a role on SOL width. In particular, it has revealed that turbulence spreading is a mechanism that edge turbulent transport affects SOL width. These experimental findings may provide a better understanding and controlling of power exhaust for present and future fusion devices.

Keyword: SOL width, edge turbulent transport, $\mathbf{E} \times \mathbf{B}$ shear, turbulence spreading