Experimental and modeling study of divertor particle flux width on EAST*

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The experimental and BOUT++ modeling study of divertor particle flux width is carried out for different types of H-mode plasmas with neutral beam (NB) and low hybrid wave (LHW) auxiliary heating schemes on EAST. The divertor particle flux width, which approximately equals to the divertor heat flux width [L. Wang et al., Nucl. Fusion 54 (2014) 114002], is adopted to replace the divertor heat flux width for the H-mode plasma study due to the poor experimental measurements of divertor heat flux profiles on EAST. For the experimental part, similar to the heat flux width, the particle flux width also decays with the increase of plasma current. The amount of the heating power seems to have no effect on the particle flux width in pure NB or LHW heated plasmas. However, the heating scheme is found to have enormous influence on the particle flux width, the width tends to be larger in plasmas with higher ratio of LHW heating power. Comparisons among the particle flux width in type-I ELMy plasmas, inter type-I ELMy plasmas and grassy ELM-averaged plasmas show that the width for type-I ELMy plasmas is much larger than those of the other two types of plasmas while the width for the grassy ELM-averaged plasmas is a little larger than those of the inter type-I ELMy plasmas, which is probably due to the different intensities of background turbulence in these three types of plasmas. Simulation work with BOUT++ code is on going to figure out the potential causes of the differences of particle flux width among these three types of plasmas and will be presented along with the experimental results.

*This work was performed for US DOE by LLNL under DE-AC52-07NA27344.