**Investigation of inward particle flux formation in the PKU Plasma Test (PPT) device**

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Turbulent particle transport causes the loss of particle in the magnetic confinement plasma devices, which degrades the confinement of plasma. The inward particle transport is conducive to transport barrier formation and confinement improvement. The inward particle flux is associated with the formation of peaked density profile, which could improve the fusion rate and contributes to the realization of steady-state discharge. And understanding the formation mechanism of inward particle flux could achieve its control, which is helpful to solve the challenge of fusion plasma fuelling.

The PKU Plasma Test (PPT) device is a linear plasma device in Peking University, China. It has a vacuum chamber with 2000mm length and 500-700mm diameter. Recently, the inward particle flux has been observed in this linear plasma device. Combining both a high-speed camera and probe diagnosis, inward particle flux and outward particle flux are observed simultaneously at certain experimental parameters. Based on the theoretical and experimental analysis, the nonlinear interaction of streamers could drive the inward particle flux in the region without the boundary effect where the density fluctuation saturated. The magnetic field impacts the distribution of the inward particle flux and the power of helicon source has an effect on the amplitude of the outward particle flux.