

Abstract Submitted  
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**Preliminary investigations on 3D PIC simulation of DPHC structure using NEPTUNE3D code.**<sup>1</sup> HAILONG ZHAO, Institute of Fluid Physics, CAEP, YE DONG, HAIJING ZHOU, Institute of Applied Physics and Computational Mathematics, CAEP, WENKANG ZOU, QIANG WANG, Institute of Fluid Physics, CAEP — Cubic region (34cm34cm18cm) including the double post-hole convolute (DPHC) structure was chosen to perform a series of fully 3D PIC simulations using NEPTUNE3D codes, massive data (~200GB) could be acquired and solved in less than 5 hours. Cold-chamber tests were performed during which only cathode electron emission was considered without temperature rise or ion emission, current loss efficiency was estimated by comparisons between output magnetic field profiles with or without electron emission. PIC simulation results showed three stages of current transforming process with electron emission in DPHC structure, the maximum (~20%) current loss was 437kA at 15ns, while only 0.46%~0.48% was lost when driving current reached its peak. DPHC structure proved valuable functions during energy transform process in PTS facility, and NEPTUNE3D provided tools to explore this sophisticated physics.

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