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Compact Torus Plasma Injection Experiments on Keda Torus eXperiment[1] CHEN CHEN, SEN ZHANG, TAO LAN, GE ZHUANG, University of Science and Technology of China, DEFENG KONG, Institute of Plasma Physics Chinese Academy of Sciences, CHIJIN XIAO, University of Saskatchewan, WANDONG LIU, University of Science and Technology of China — A new compact torus injection system (KTX-CTI) is developing on Keda Torus eXperiment (KTX) reversed field pinch device. The KTX-CTI is a three-meter long linear device to inject compact torus (CT) plasma into KTX at a high speed. It includes the vacuum vessel, central solenoid, high speed gas valves, timing system, pulse power supplies and CT exclusive diagnostics. Currently, the KTX-CTI is in the engineering commissioning. The maximum injection mass of the CT is 50 μg for hydrogen, which is about 30% of total KTX plasma particle inventory. The maximum electron density and axial speed are 1x10^{22}m^{-3} and 150 km/s, respectively. For CTs injected with KTX-CTI having tangential component, it is possible to affect toroidal rotation of the KTX plasma due to the momentum transfered from the CT to KTX bulk plasma. In addition, a small amount of helicity can also be injected for the single helicity mode research expected to improve the confinement for reversed field pinch plasma. As an advanced fueling system with very high penetration speed about two orders higher than common fueling, the KTX-CTI will be used as a prototype device prepared for central fueling of China Fusion Engineering Test Reactor (CFETR) in the future.

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