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# Effects of the J-TEXT TBM mock-up on the equilibrium magnetic field and error field

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A scaled mock-up of the China Helium-Cooled Ceramic Breeder Test Blanket Module (CN HCCB-TBM) was installed to the J-TEXT in order to study eddy current distribution, electromagnetic load and thermal load on the TBM during plasma disruption. J-TEXT TBM mock-up using reduced activation ferritic/martensitic (RAFM) steel as structural material. The measurement experiments investigated the effects on the equilibrium magnetic field and error field in the presence of J-TEXT TBM mock-up containing ferromagnetic material. The experiments have measured TF ripple along the toroidal direction and the difference of vertical field over the plasma region by installing PCB poloidal array of magnetic probes inside the J-TEXT vacuum vessel with the mock-up at different positions. The error field introduced by the mock-up was evaluated by comparing phase difference and the amplitude variation of the signal of poloidal and toroidal Mirnov magnetic probes array. The amplitude and spatial phase of the error field were measured by scanning the spatial phase of an externally exerted resonant magnetic perturbation and fitting the mode locking thresholds. The experiment results show that the TBM mock-up in J-TEXT will change the shape of equilibrium magnetic field in vacuum vessel significantly, especially in low field side in front of the mock-up.The magnitude of 2/1 component of the radial error field introduced by the mock-up is about 10ˆ−4 relative to the base toroidal field. On the other hand, the effects will produce only a few potentially troublesome problems on the normal discharge.

## Eligible for student paper award?

No

**Authors:** Dr ZHANG, Zhengqing; Dr RAO, Bo; Prof. ZHANG, Ming; Prof. WANG, Weihua; Prof. LIU, Sumei; Mr SHENG, Daolin; Dr ZHANG , Jun; Mr ZHENG, Panfeng; Mr ZHOU, Song; Prof. YU, Kexun

**Presenter:** Dr ZHANG, Zhengqing

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