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4.9 Simulations of Scattered neutrons for the time of flight enhanced diagnostics (TOFED) neutron spectrometer at EAST

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The TOFED (double-ring Time-Of-Flight Enhanced Diagnostics) neutron spectrometer has been installed outside the EAST tokamak hall. The TOFED line of sight (LOS) is defined by the collimator through the wall of EAST hall, which can reduce scattered neutrons and background gamma-rays for the neutron spectral measurements. The Monte Carlo code MCNP5 is used in the simulations to characterize the collimation effect. The MCNP5 simulations show that background radiations at detectors have been reduced significantly which satisfies the requirement for TOFED operations at EAST. The angular distribution of the incident neutrons and the proportion of the scattered neutrons in the LOS of the TOFED are obtained for the measured spectral data interpretation.

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