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12.46 Development of Gamma Ray Spectroscopy with High Energy and Time Resolutions on EAST Tokamak

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Gamma ray spectroscopy with high energy and time resolutions is developed on EAST tokamak to study fast ion and runaway electron behaviours. The energy resolution of the spectroscopy is about 3.9% @ 662 keV based on the LaBr₃(Ce) scintillator crystal, and the spectroscopy can operate stably at counting rate as high as 2 MHz, monitored by the monitoring system based on two independent light emitting diodes (LED) which send light pulses via optical fibers to the spectroscopy. The spectroscopy is calibrated by means of photon sources, then unfolding of pulse height spectra of the spectroscopy is performed. The results proved this spectroscopy with high energy and time resolutions can be used to reconstruct the distribution functions of fast ions and runaway electrons. First results from this gamma ray spectroscopy in EAST experiments is given.

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