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P2.073 Study on the effects of the Signal to Noise ratio on the error in counting of the ITER Radial Neutron Camera (RNC)

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RNC main purpose is to measure the uncollided 14 MeV and 2.5 MeV neutrons from deuterium-tritium (DT) and deuterium-deuterium (DD) fusion reactions through an array of detectors located in collimated lines of sight (LOS) viewing the plasma through the ITER Equatorial Port Plug #1. The measures will be used to calculate the neutron emission profile (neutron emissivity)

The environment where the RNC is to be located will be very noisy, affecting the precision of the measure of the neutron and gamma particles count rates.

The paper presents a study focusing on finding the maximum allowed S/N ratio, maintaining the counting error below a certain threshold (10%). Experiments will be carried out with the CAEN 5800 detector emulator, which is able to produce a particle spectra similar to the one expected in ITER.

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