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P2.060 Strategy and guidelines for the calibration of the ITER radial neutron camera

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A calibration procedure is proposed for the entire lifetime of the ITER Radial Neutron Camera (RNC) diagnostic. The proposed calibration is divided in different phases: pre-delivery calibration, post delivery calibration and periodic calibrations at different time intervals. The RNC calibration relies exclusively on radiation sources available at the domestic agency in the pre-delivery phase and on embedded neutron sources for all the calibrations after the delivery to and installation in ITER. No in-vessel calibration using external neutron sources is required: instead, it is proposed to rely on reference ITER pulses for the tracking of the calibration in time. The use of a neutron generator inside the RNC for neutron efficiency monitoring has been investigated based on present-day commercially available manufacturer, and disregarded as it introduces unnecessary complexity to the RNC diagnostic without substantially improving the long term calibration. The calibration of the RNC will be supported by numerical simulations for the validation of the calibration and for their subsequent monitoring. Radiation sources for each type of detector have been identified but their strength has not been determined as this will depend on the level of background radiation at the detector location which can be estimated only in the final design phase of the RNC. Monte Carlo calculations will be required for this step and for determining the effect of the embedded calibration sources intended for one type of detector on the other detector types.

Presenter: CECCONELLO, Marco (Department of Physics and Astronomy Uppsala University)**Session Classification:** P2