



Contribution ID: 642

Type: **not specified**

P2.070 Irradiation test of fiber optics for H-alpha diagnostics in ITER

Tuesday, 18 September 2018 11:00 (2 hours)

The reliability of the optical diagnostics in ITER critically depends on radiation resistance of the fiber optics for a transmission of plasma light to remote detectors. The design of H-alpha diagnostics includes fiber bundles about 60 m long between the port cell and the diagnostic room. The first 10 m of the bundles run through the gamma-neutron fields. This part of the bundle will accumulate the absorbed dose of no more than 2 kGy (for silica) and the total neutron fluence of 1014 n/cm² in the ITER lifetime (2·10⁷ s or 40 000 pulses). The modern types of radiation resistant silica-based fibers can be applicable in ITER for use in the visible range. The convenient way to select the fiber type is to make in-situ gamma irradiation test. The test has to be performed at a dose rate comparable to the radiation conditions in the ITER facility. The report is devoted to the irradiation tests of silica fiber samples in a Co-60 gamma source at the dose rate of 0.01 G/s. Three types of silica based fibers were tested. The transmission losses of the fibers were measured in-situ in the spectral range of 400-700 nm. The conclusion was made about the applicability of the one tested fiber type for the H-alpha diagnostics in ITER.

Presenter: Dr VUKOLOV, Konstantin (Kurchatov Institute)**Session Classification:** P2