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CXRS-edge Diagnostic in the Harsh ITER Environment

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CXRS diagnostics supply a set of important plasma parameters of fusion plasmas. According to the system requirements, the CXRS diagnostics in ITER should supply plasma velocity (poloidal and toroidal), impurity ion densities and ion temperatures. The ITER CXRS-edge diagnostic system must measure these parameters over the outer half of the plasma radius.

The use of CXRS in ITER encounters serious challenges. In the paper the decisions made to overcome these difficulties for ITER CXRS-edge diagnostics system are described.

Testing results of SC Mo prototypes of first mirror are presented. The results of image quality modelling of optical scheme, where the in-vacuum optics uses only mirrors and all lenses are in the air part rather far from plasma, are presented. The results of laboratory test of the device developed for CXRS-edge on the base of transmission holographic gratings are presented.

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