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P1.1012 Physics requirements for the VUV survey spectrometer intended for the divertor radiation monitoring on JT-60SA

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See the full abstract here:
http://ocs.ciemat.es/EPS2019ABS/pdf/P1.1012.pdf

JT-60SA is a fusion experiment designed to support the operation of ITER and to investigate how best to optimize the operation of future fusion power plants. For the safe operation of the device, a survey spectrometer observing the plasma from an equatorial port is foreseen to monitor light impurities such as carbon and oxygen, metal impurities and extrinsic impurities injected ad hoc to mitigate the power exhaust problem. A second survey spectrometer, to be designed and constructed within the presented work, positioned on an upper port with a vertical line of sight, will complement the monitoring activity of the first system by measuring the relative contribution of the various impurities to the radiation losses in the divertor region and by studying the physics of the plasma-divertor detachment mechanism. It is aimed at up to 1 ms time resolution, 20-130 nm wavelength range and, when in imaging mode, a space resolution of about 5 cm. This contribution will highlight the details of the spectrometer-divertor plasma optical coupling, designed in order to optimize the inspection of the divertor region, the two dimensional detector to be used and the alignment procedure. The zero order of the spectrometer is planned to be fed into a visible spectrometer via fiber optics for the absolute calibration of the VUV spectrometer and also to provide monitoring of high n transitions of various C or Ne ionization states. The spectrometer, jointly designed by an EU-Japan team, will be procured by Eurofusion and installed on JT60-SA in late 2022.

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Presenter: CHERNYSHOVA, M. (EPS 2019)

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