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Characterization of a manson type source for absolute calibration of EUV/VUV spectrometers in the wavelength range 1-25 nm

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ITER VUV (Vaccuum Ultraviolet) spectrometers play an essential role in impurity diagnostics of high-temperature plasmas, since impurities produced from divertor and edge plasma in ITER such as tungsten (divertor), beryllium, oxygen (first wall), neon, nitrogen (seeding) and helium (fusion ash, GDC). A space-resolved ITER VUV spectrometers working in wavelength range of 2.6-160 nm is willing to be installed in ITER equatorial #11 to measure radial profiles of impurity line emissions and for the impurity transport study and effective ion charge (Zeff) measurement, respectively. For these purposes the absolute calibration of the space-resolved ITER VUV spectrometers is required. Due to a qualitative limitation of conventional methods for the absolute calibration using synchrotron orbital radiation source and branching ratio technique, a new method based on the 642-1 multi-anode UHV SXR manson type light source (Mcpherson Inc.) has been developed and could be successfully applied to calibration of the ITER VUV spectrometers in wavelength range of 1-25 nm. The single-wavelength EUV light generated by the collision of accelerated electrons on the metal target of the manson type source could be discriminated through CCD device. With Zr, Mo, Ti, Mg, 4 metal targets, we could identified the position of each characterized emission light and calibrated with those lines to fit the wavelength calibration curve. Therefore, wavelength calibration is well fitted with $R^2 = 0.997$ with manson type source

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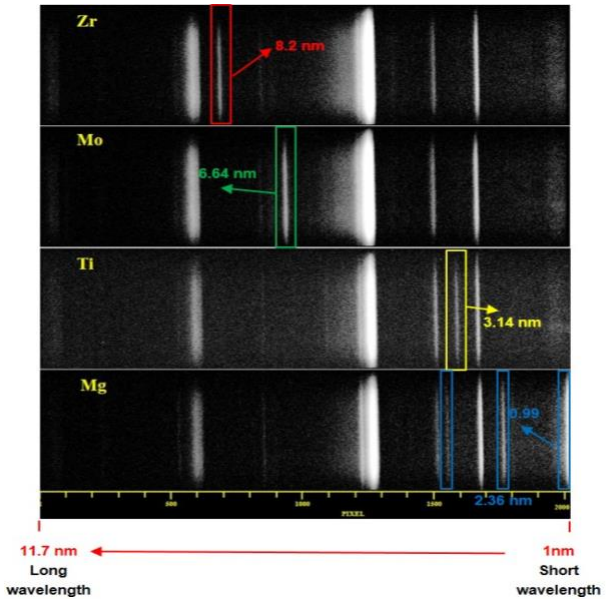

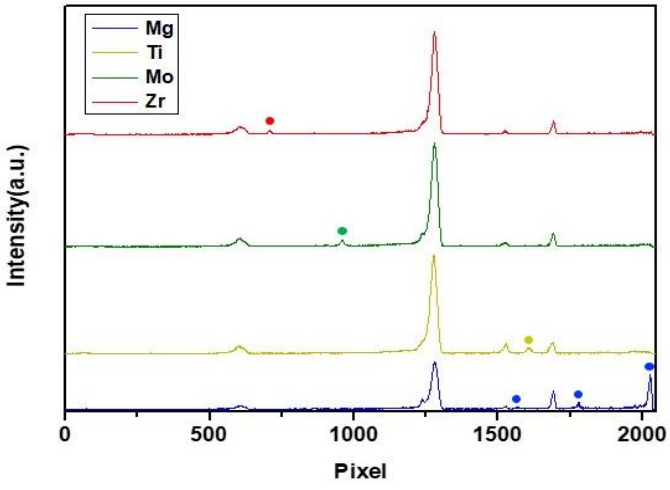

Figure 1. Spectral images acquired by the CCD for different anode targets