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2.50 Title of Abstract: Application of Portable Near-Infrared Spectrometer to Heliotron J Plasmas

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A Simple near-infrared (NIR) spectrometer for 898 - 2130 nm has recently been applied to Heliotron J plasmas. It adopts symmetrical crossed Czerny-Turner mount equipped with a thermoelectrically cooled 512 channel InGaAs linear sensor. Reciprocal linear dispersion was deduced as 96.37 nm/mm at the center of the detector. Several types of the 2nd order rejection filter are inserted in the collection optics as needed. Calibration was performed together with a visible spectrometer using a tungsten halogen lamp and the result was compared with the intensity ratio of the Paschen α (1875 nm) and Balmer β (486 nm) lines, both of which have a common upper quantum level. The purpose of this study includes extending the wavelength region of the spectral monitor to less contaminated region. In the preliminary measurements, we observed the Paschen series for the hydrogen pellet injection plasma and two atomic helium lines, i.e. 2S-2P singlet and triplet lines, for Helium gas puffing experiments. A Continuum spectrum in this regime is entirely attributable to the blackbody radiation from the heat spots on the plasma-facing components. In addition, this may also be used to monitor if there are any significant background radiation in the YAG Thomson scattering signals near 1064 nm.

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