Solar and LHD Plasma Diagnostics

T. Watanabe,[1] T. Kato,[2] I. Murakami,[2] M. Yamamoto[3]

[1] *Nat. Inst. Astron. Obs., NINS, Mitaka, Tokyo, Japan*
[2] *Nat. Inst. Fusion Sci., NINS, Toki, Gifu Pref., Japan*
[3] *Nagoya Univ., Nagoya, Aichi Pref., Japan*

watanabe@uvlab.mtk.nao.ac.jp

Domain : Astrophysics

Japanese sun observing mission; Solar-B is to be launched on 23-Sep-06. The EUV Imaging Spectrometer (EIS) on board Solar-B [1] will be able to observe, for the first time in Solar EUV observations, spectra and monochromatic images of non-ionization-equilibrium plasmas in the solar transition-region and corona at two-wavelength bands of 170 - 210Å and 250 - 290Å, with typical time-resolutions of 1 - 10 seconds. Time-dependent collisonal-radiative model has been developed to diagnose temperatures and densities of those plasmas in the outer atmospheres of the Sun. No systematic models yet exist for iron ions of L- and M-shells, which are very important for coronal plasma diagnostics. Atomic data of FeX to FeXV are surveyed and evaluated, and most recommended data are determined[2]. Obtaining of the experimental data is recommended: Possibility of getting the experimental data of ionization and recombination cross sections for iron ions with an EBIS instrument called NICE (Naked Ion Collision Experiment) and a new EBIT (Electron Beam Ion Trap) for EUV lines is in consideration. EUV spectra in the wavelengths of 170 - 190Å were also taken by Large Helical Device (LHD) of NIFS, injecting iron TESPEL (tracer-encapsulated solid pellet).

[1] Culhane, J. L. et al.: 2005, Ad. Sp. Res., 36, 1491.
[2] NIFS-DATA95, 2006, in press.