

## Detection Criteria of OVI Doublet and Opto-mechanical Error Budget of FIMS

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The main contributions to the equilibrium radiative cooling curve between 105.5 K and 107 K are from the doublet of OVI 1032 and 1038 Å in the FUV spectral region. The detection of OVI emission is one of the main objectives of FIMS (Far-ultraviolet Imaging Spectrograph) on KAISTSAT-4. We present the scientific importance and detection simulation of OVI doublet using a Monte Carlo technique and a chi-square statistics. The simulation shows that FIMS experiments can resolve the predicted OVI doublet during sky-survey phase and thus the global distribution and energetics of the interstellar medium. The OVI detection limits for various observation time scales as well as previous theoretical and observation limits are presented. Optical tolerancing is a process involving three essentials. The first is the specification of one or more performance criteria. The second is a means of computing the performance of the system in terms of these criteria and the sensitivity of system performance degradation to manufacturing errors. The third is a method of budgeting the errors to satisfy the performance specification within acceptable cost goals. A main performance criterion of FIMS comes from the OVI detection limit analysis. Tolerance study of FIMS optical system has been performed extensively including decentration and tilt of optical elements, and manufacturing figure errors of parabolic collecting mirror and ellipsoidal grating. The performance criteria, opto-mechanical error budget of FIMS optical system are discussed.