

Solar Low Energy X-ray Spectrometer (SoLEXS) on-board Aditya-L1

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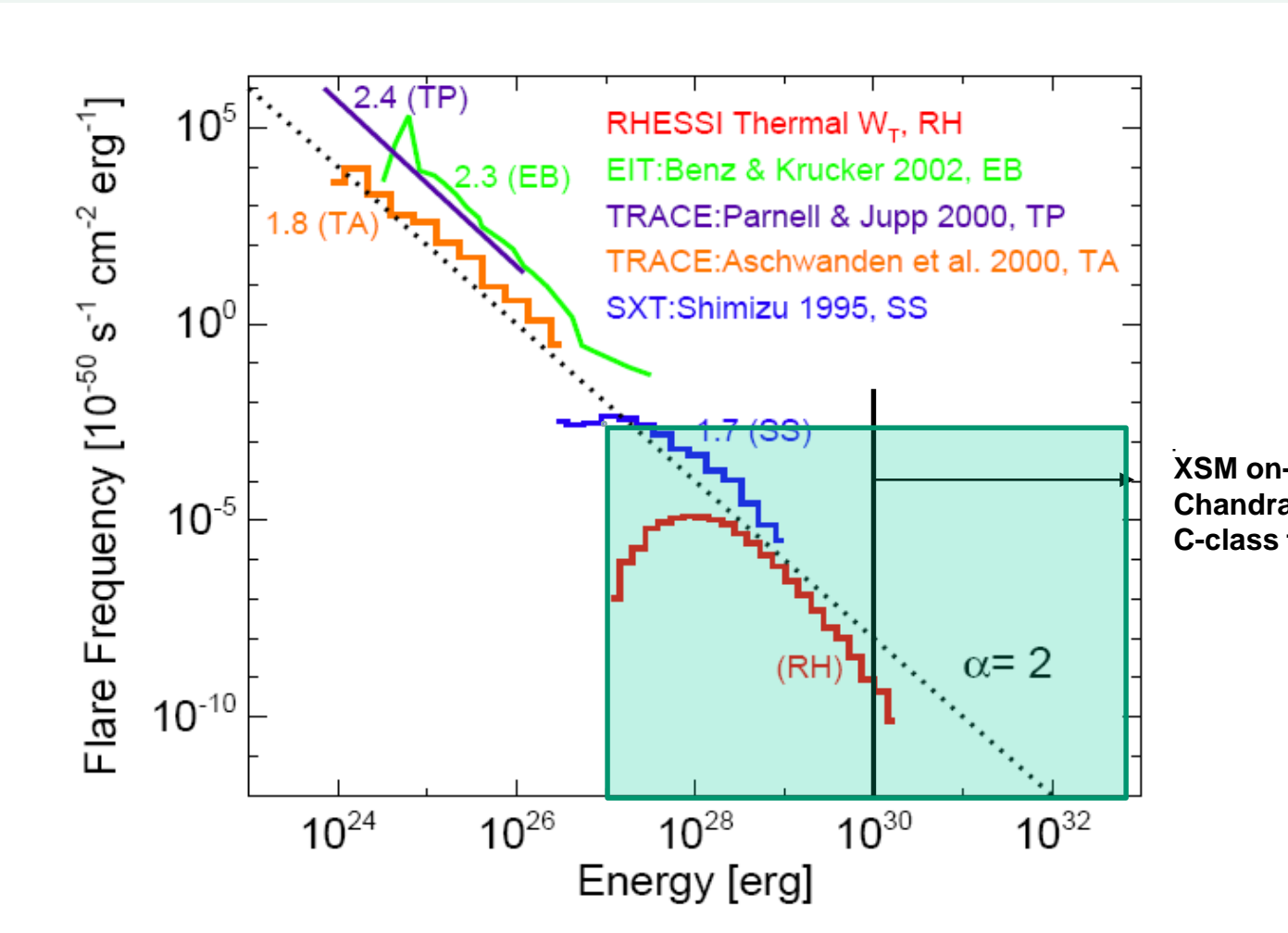
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Abstract

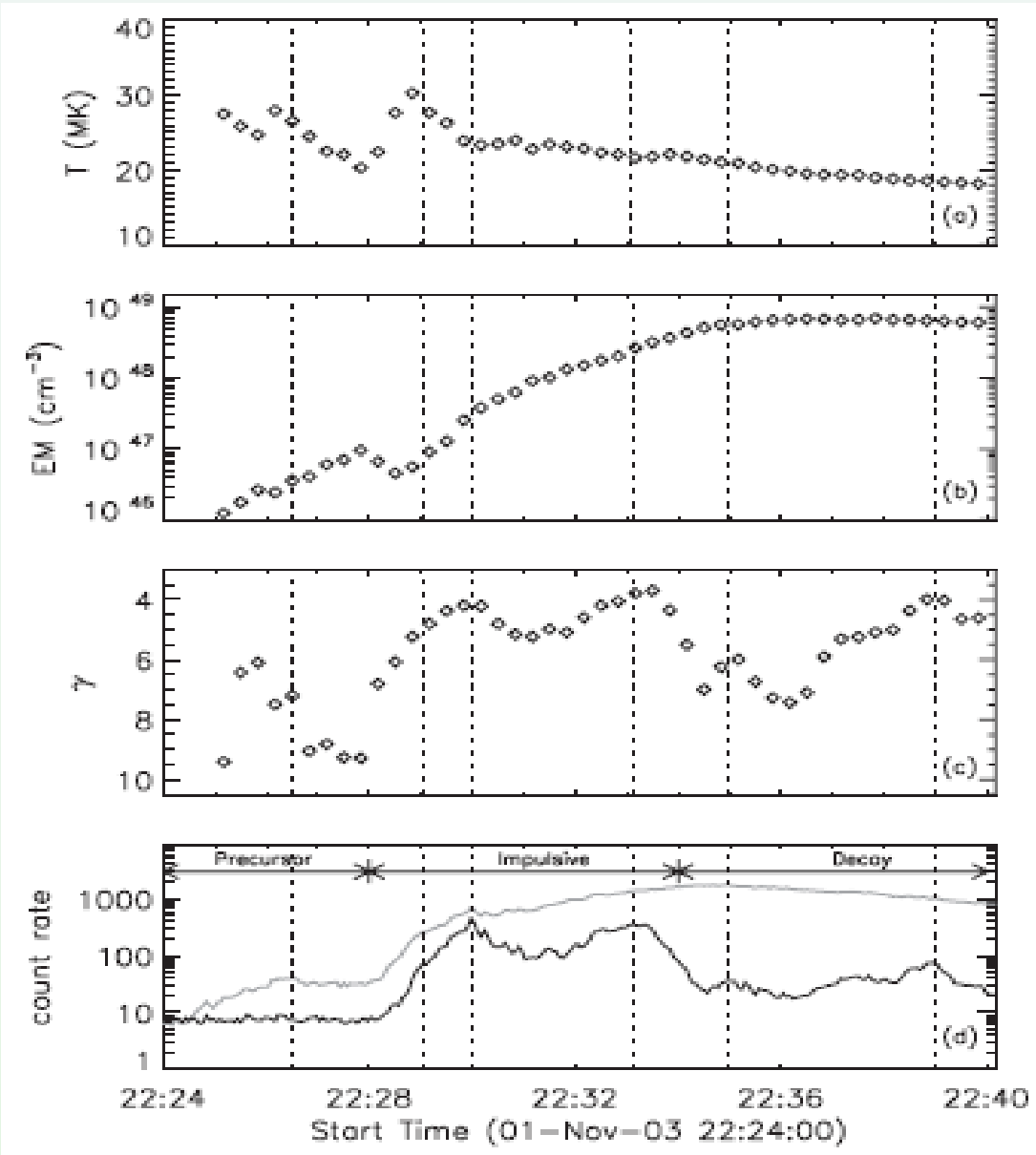
A soft X-ray spectrometer is being developed to study the solar flare spectra in the energy range of 1 - 30keV. The objective of this instrument is to obtain the sun-as-a-star flare spectra for all classes of flare using a single instrument with a moderate spectral resolution ($< 4\%$ at 6keV) allowing us to model the coronal physical parameters including abundances with better accuracy compared to RHESSI. The instrument will utilize the high count rate capability of Silicon Drift Detector (SDD) to look at the Sun. This instrument is also designed to provide flare trigger to other instruments on-board Aditya-L1 to optimize their observing mode. The status of this instrument and its scientific goals will be discussed in this paper.

Major Science Goals

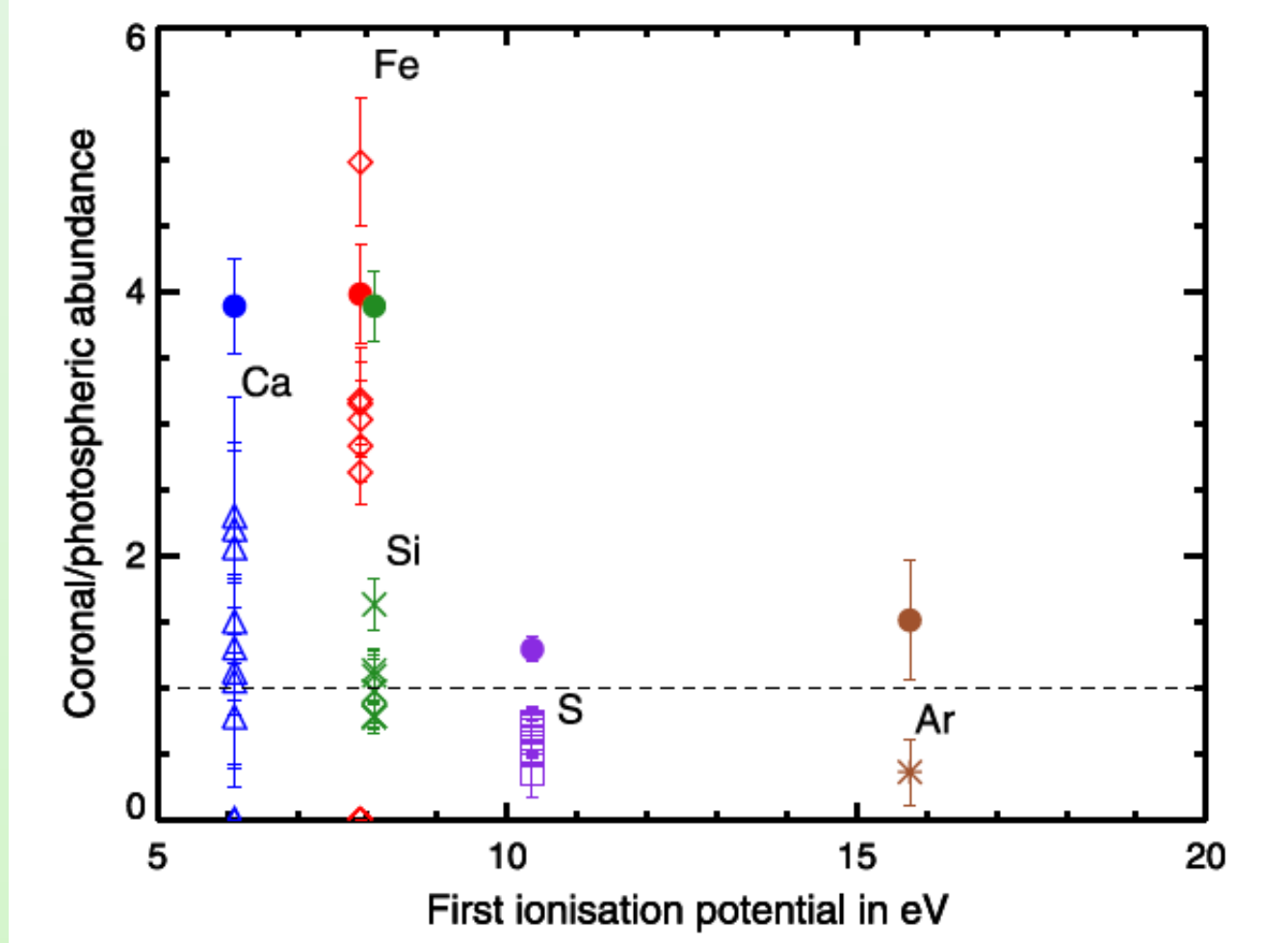
- Flare Studies (A - Class to X - Class Flares):
- DC Heating Mechanism



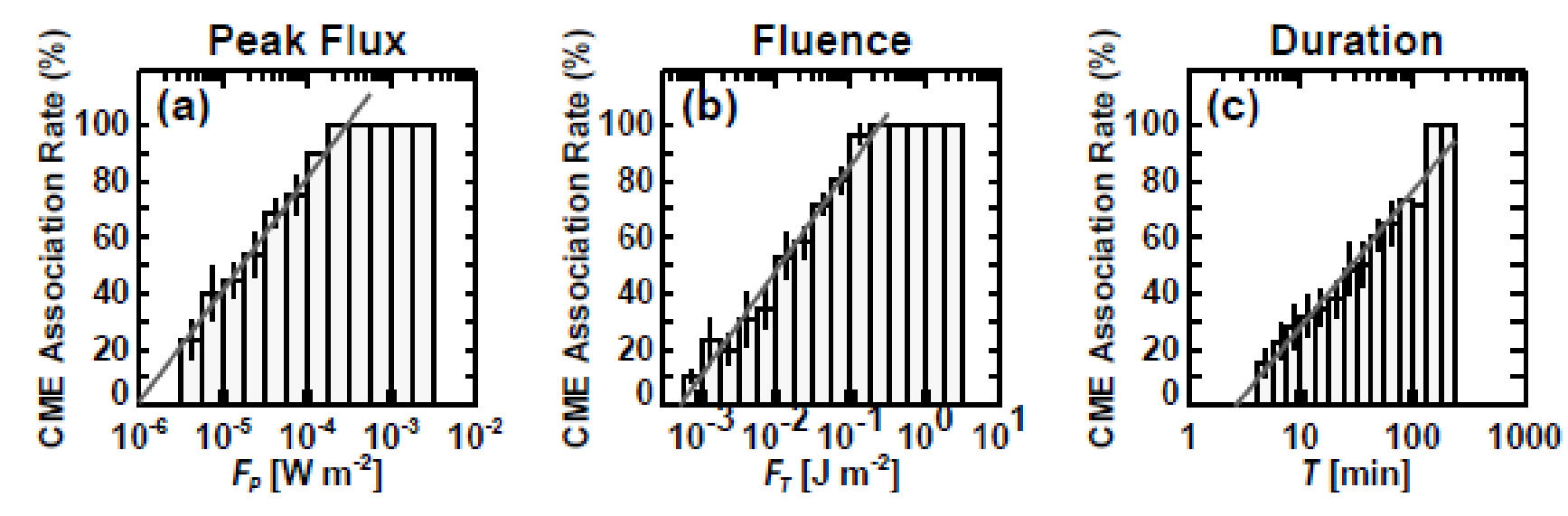
- Pre-cursor Activities



- Coronal Studies:
- Coronal Abundances



- CME - Flare Association



SoLEXS' Spectroscopic Capabilities & Other Missions'

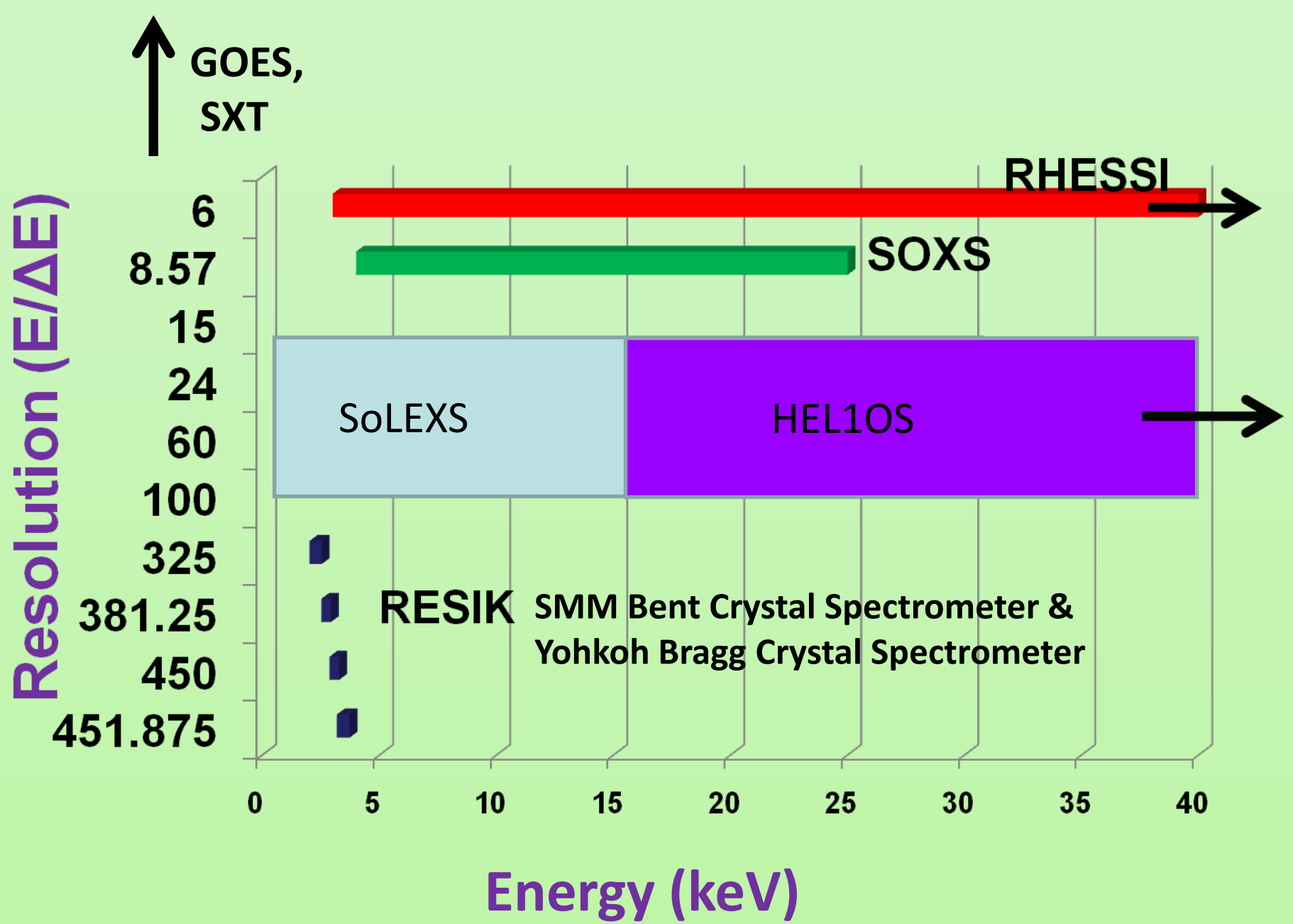
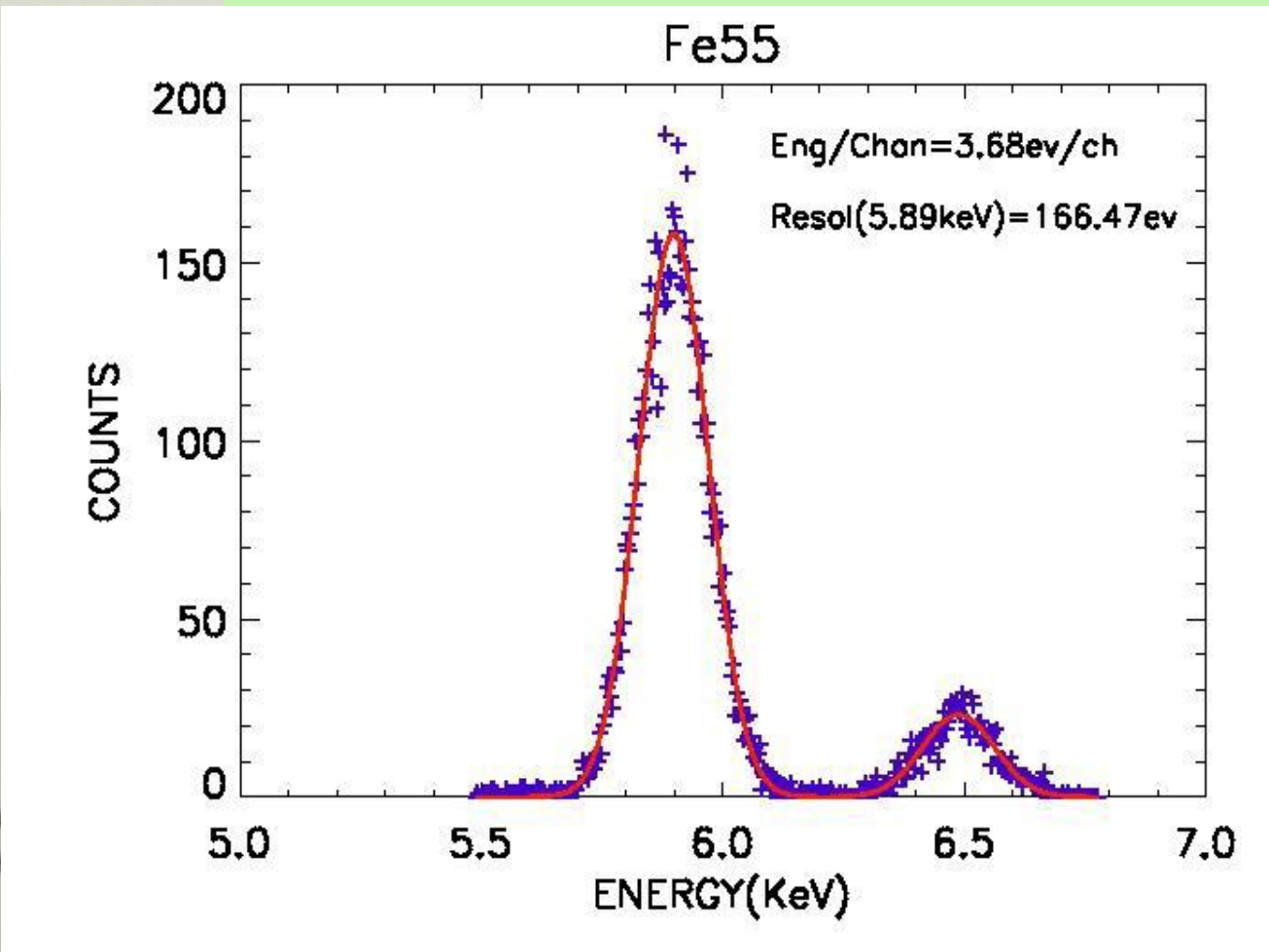


Fig. 1. Schematic tri-dimensional view of a SDD with integrated FET.

Silicon Drift Detector

Electronics Box

Status



- Laboratory testing of the CSPA and DPP is tested and achieved the performance
- Engineering Model is under way: Electronics box completed both mechanical as well as PCB cards
- Engineering model is being tested currently
- Detector box mechanical completed; PCB cards under fabrication
- EM end-to-end testing expected during March 2016

Acknowledgements

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| Science Goals | Critical Inst. Requirements | Remarks |
|---|--|--|
| Flare Studies - Heating | •Energy Range: 1-30keV •Flare Coverage: <A-class to X-class | •GOES Imager •SUIT Complement •RHESSI - cut-off at 6keV |
| Flare Studies - Pre-cursor activities | •Spectral resolution < 500eV at 6keV | •RHESSI - Only Few Flares •SUIT Complement |
| Coronal Studies - Abundances | •Spectral Resolution: < 250keV at 6keV •Energy Range: 1 - 10keV •Timing: Few Seconds | •XSM - Chandryaan - I •RESIK - poor continuum |
| Coronal Studies - Flare-CME Association | •Timing: Few Seconds •Flare Coverage: < A-class to X-class | •Coronagraph Continuum Channel •First time both Flare and CME instrument together on a single mission |