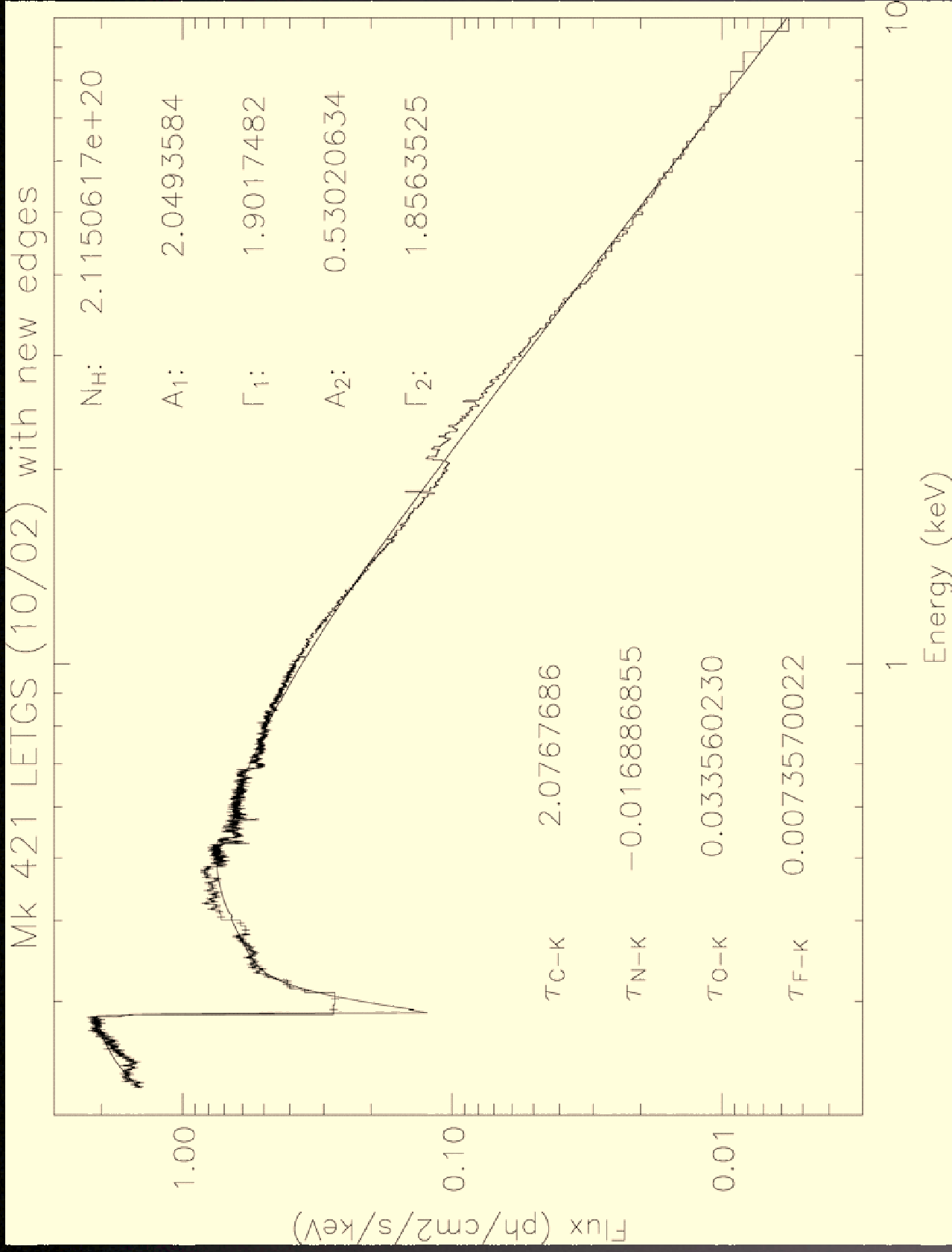


# Effective Area of the HRMA near the Ir M-V edge at 2.1 keV

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# Effects of Pileup

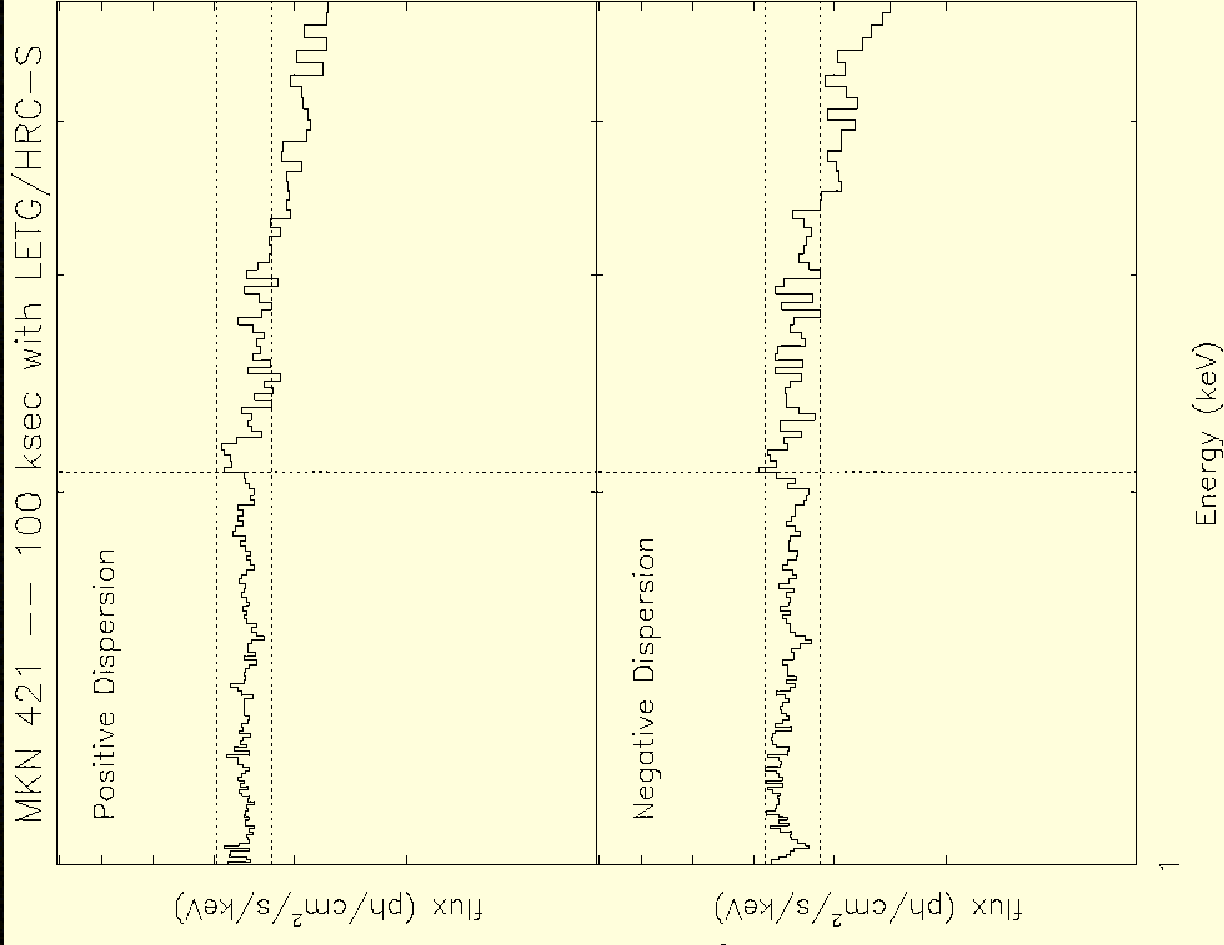
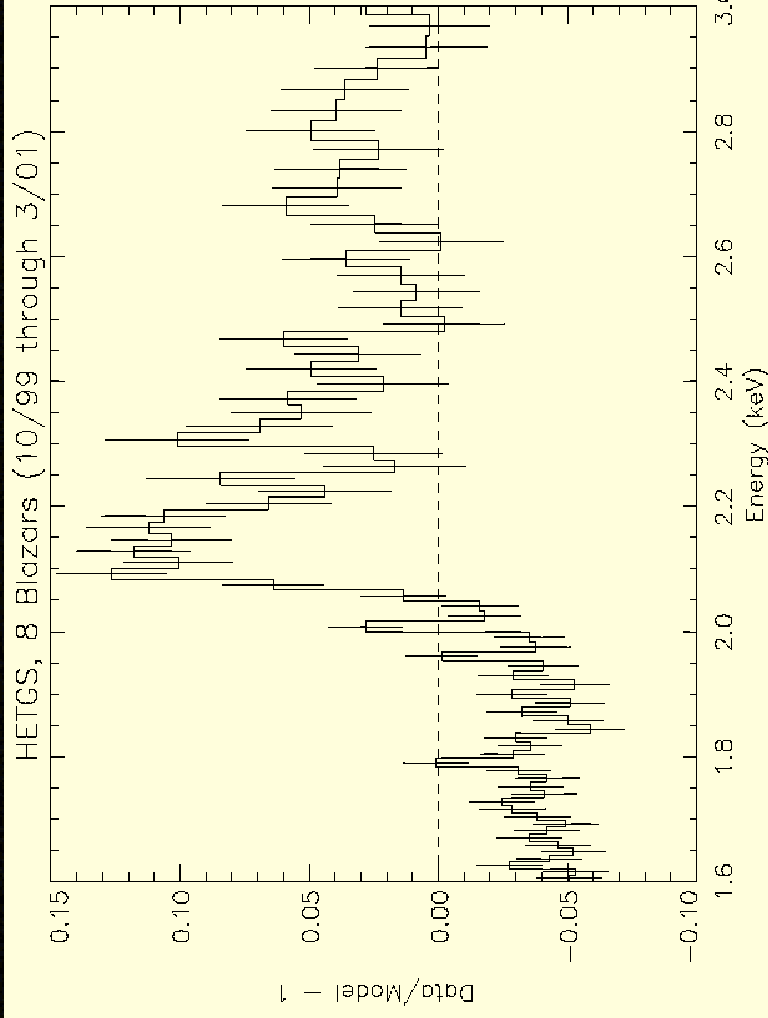


# Pileup in Grating Spectra

- Pileup appears at Ir-M edge due to peak in effective area
- Rate (Rf)  $\sim 0.01$  count/frame/column incur  $\sim 8\%$  loss
- highly nonlinear effect — Rf = 0.1 gives  $\times 2.1$  correction
- For Mk 421, Nf =  $1.3e5$ , Rf = 0.05; jump = 19%



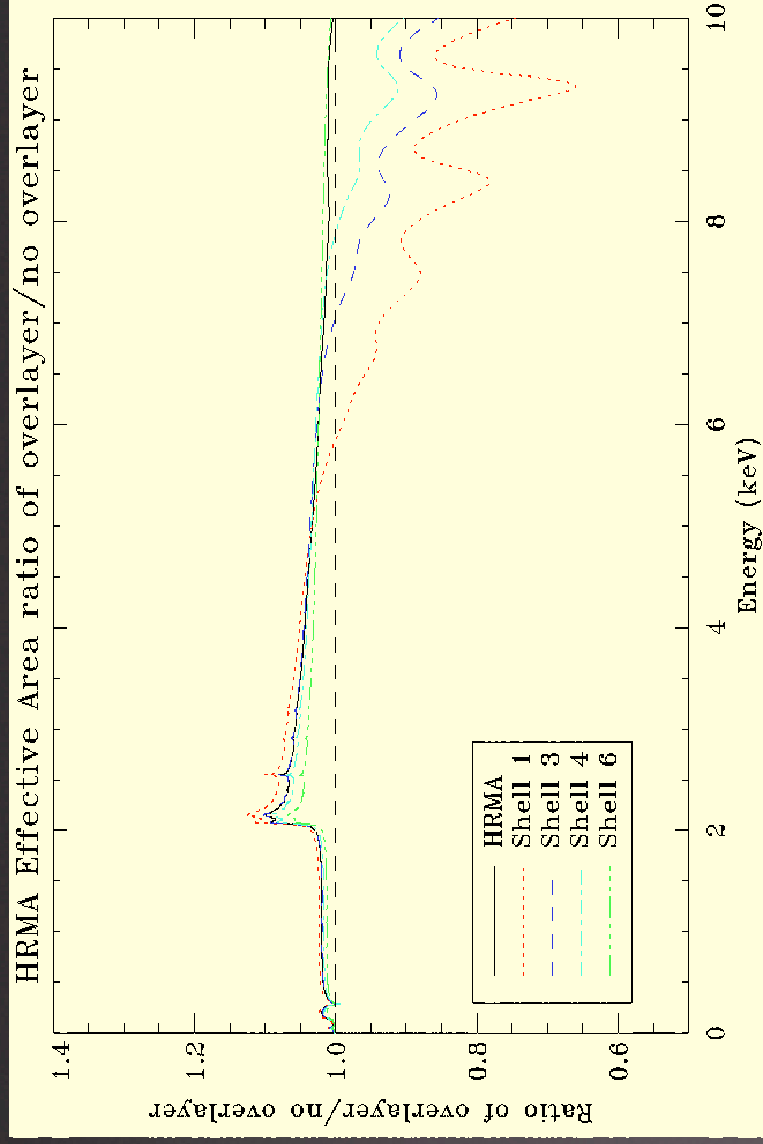
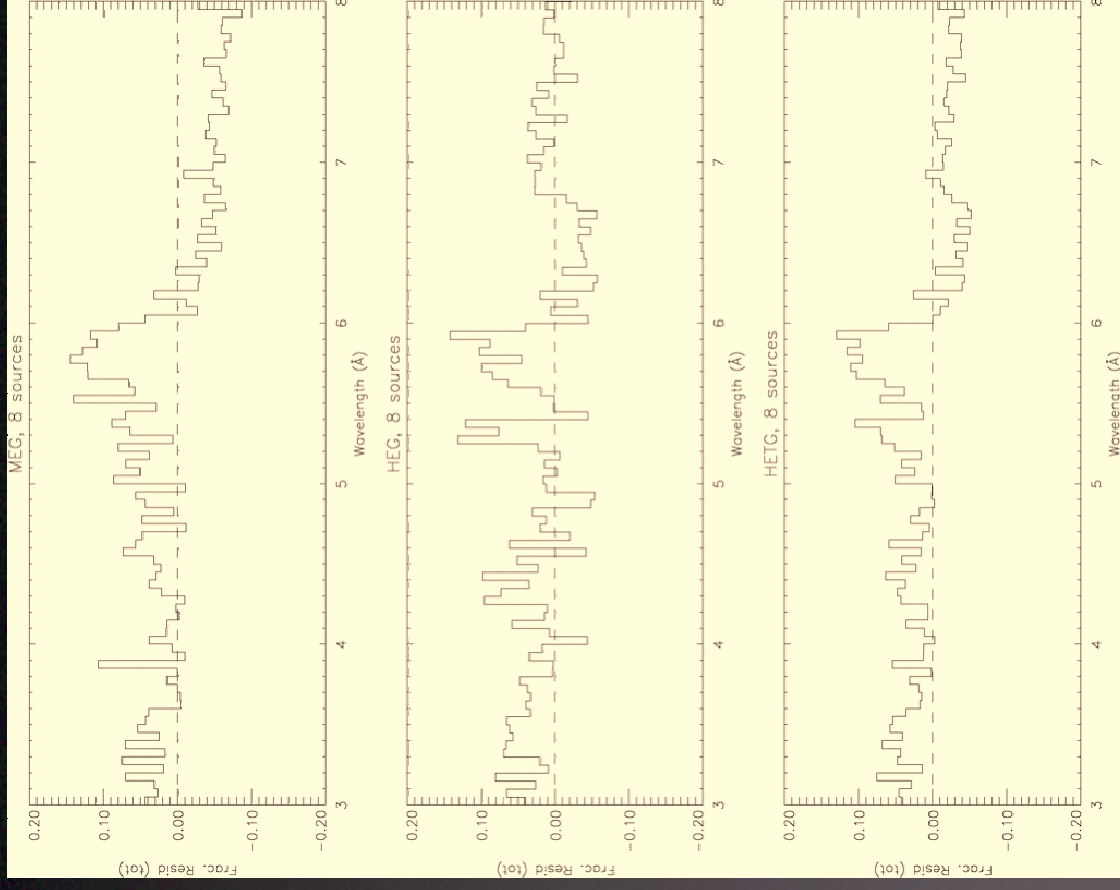
# HETGS and LETGS Data



- Both in MEG and HEG
- Energy is 2.08 keV, same as Ir M-V edge
- Effect ~ 5-10%

# Thin Overlay on HRMA Changes Edge

- HRMA modeling with 10-15 Å of CH<sub>2</sub> enhances area above Ir M-V edge
- Enhancement reduced for shells 4 & 6 — reduced effect in HEG observed
- Thickness of layer is consistent with some pre-launch expectations



# Summary

- Grating spectra indicate a  $\sim 10\%$  correction is needed at the Ir-M edge
  - HETGS and LETGS data agree on
    - location of the edge: 2.08 keV
    - the magnitude and shape of a deviation
- Current model is a 15-20 Å contamination layer (not related to ACIS contamination)
  - Layer gives the right magnitude at the Ir-M edge
  - Layer thickness is “reasonable”
  - Model predicts edge depth depends on shell, as observed by MEG and HEG

# Planned Tasks

- Determine an ad hoc correction to HRMA model
- Combine more HETGS observations to get a better jump estimate, then fit for layer thickness
- Reevaluate contribution by pileup: estimated to be <3%
- Search for time dependence in HETGS data