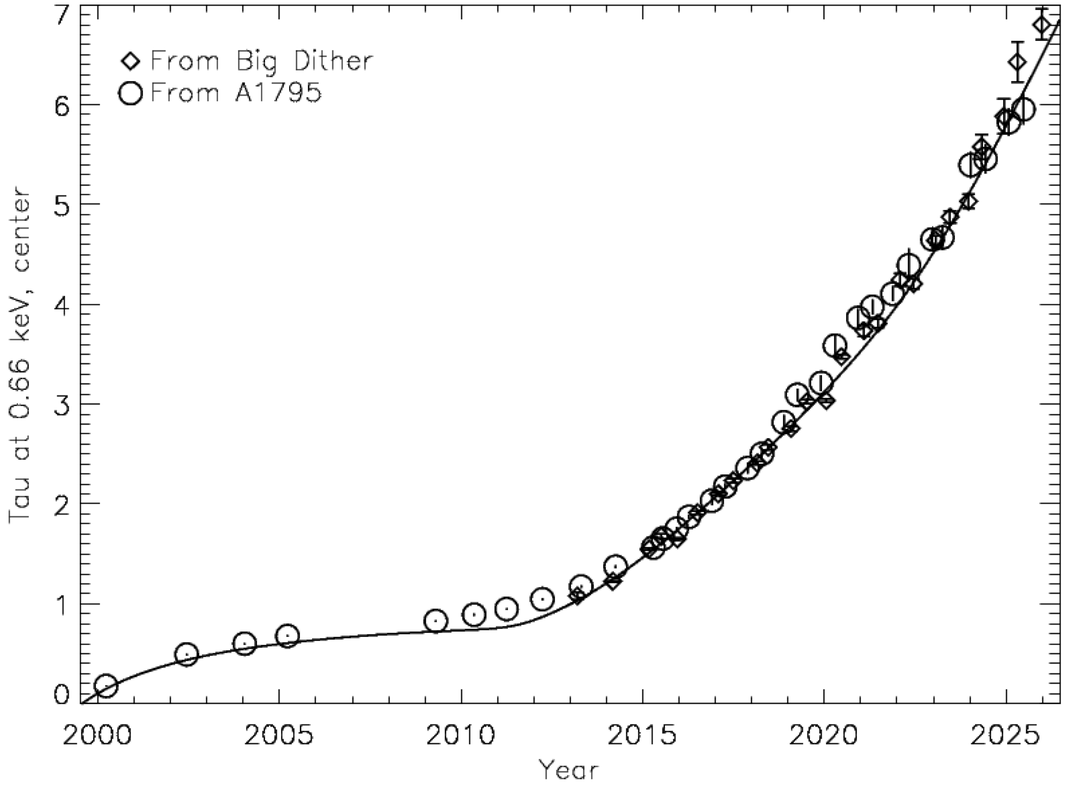
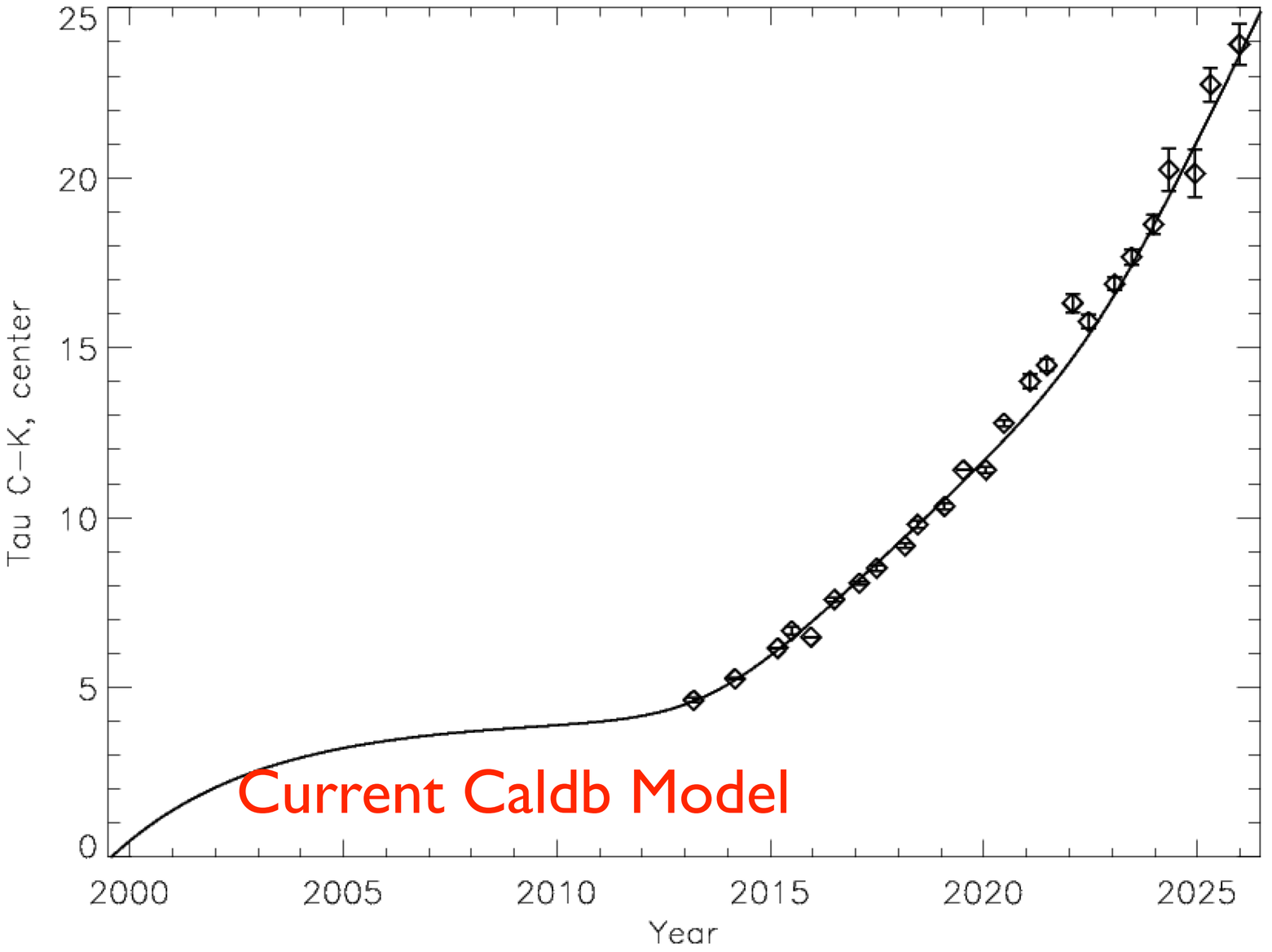
ACIS Contamination Update

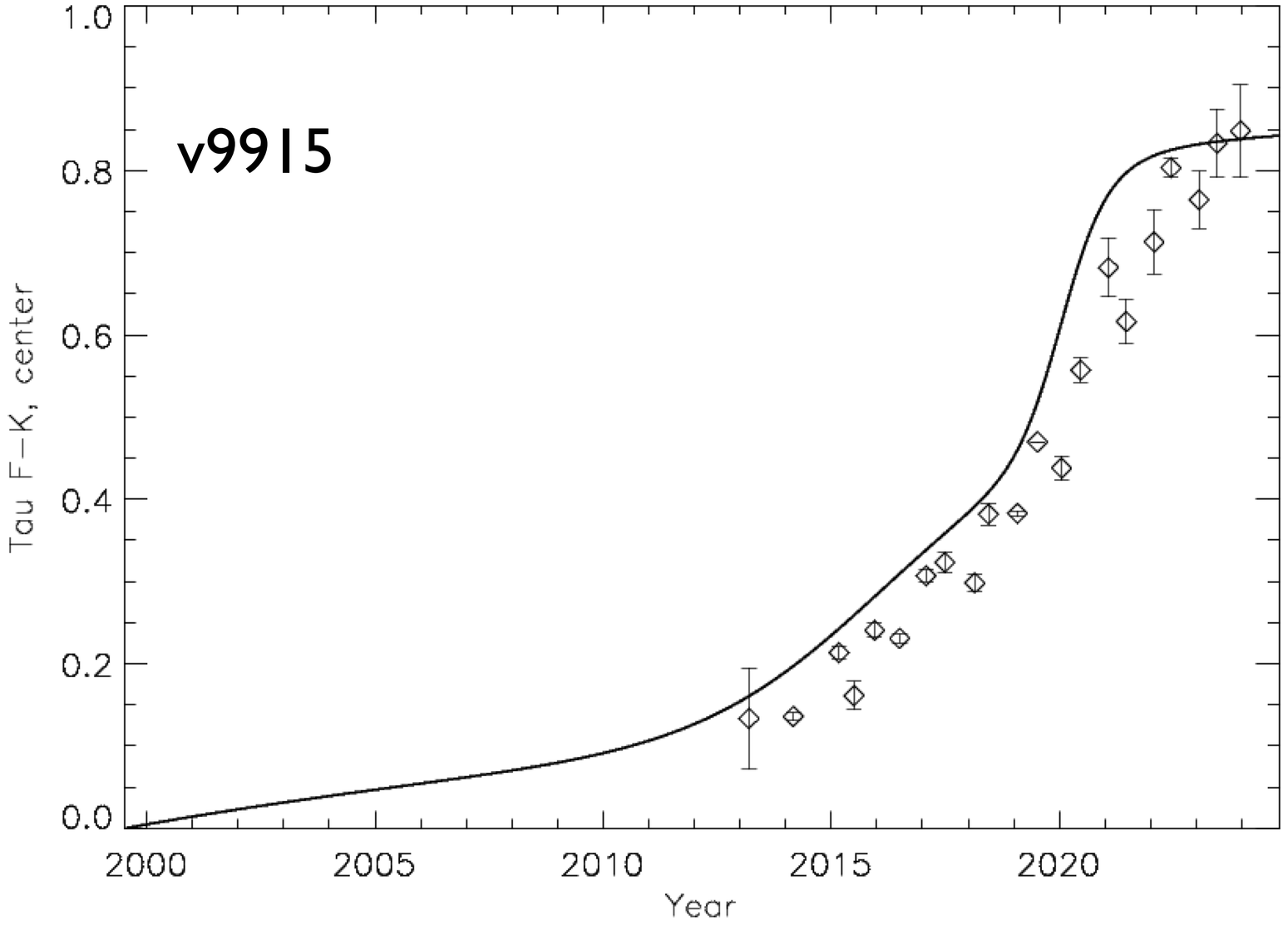
- Revised model in 2025
  - improved model of F-K time dependence
- Big Dither spectra are harder to fit!
  - F-K correlated to C-K: tying optical depths
  - Soon: tie O-K to C-K as f(row)
  - Center to edge: C-K is flat, O-K increases
- Check 0.248-0.262 keV with RX J1856, LETG
  - C,O, F all contribute to opacity below C-K edge
  - Now too faint to use



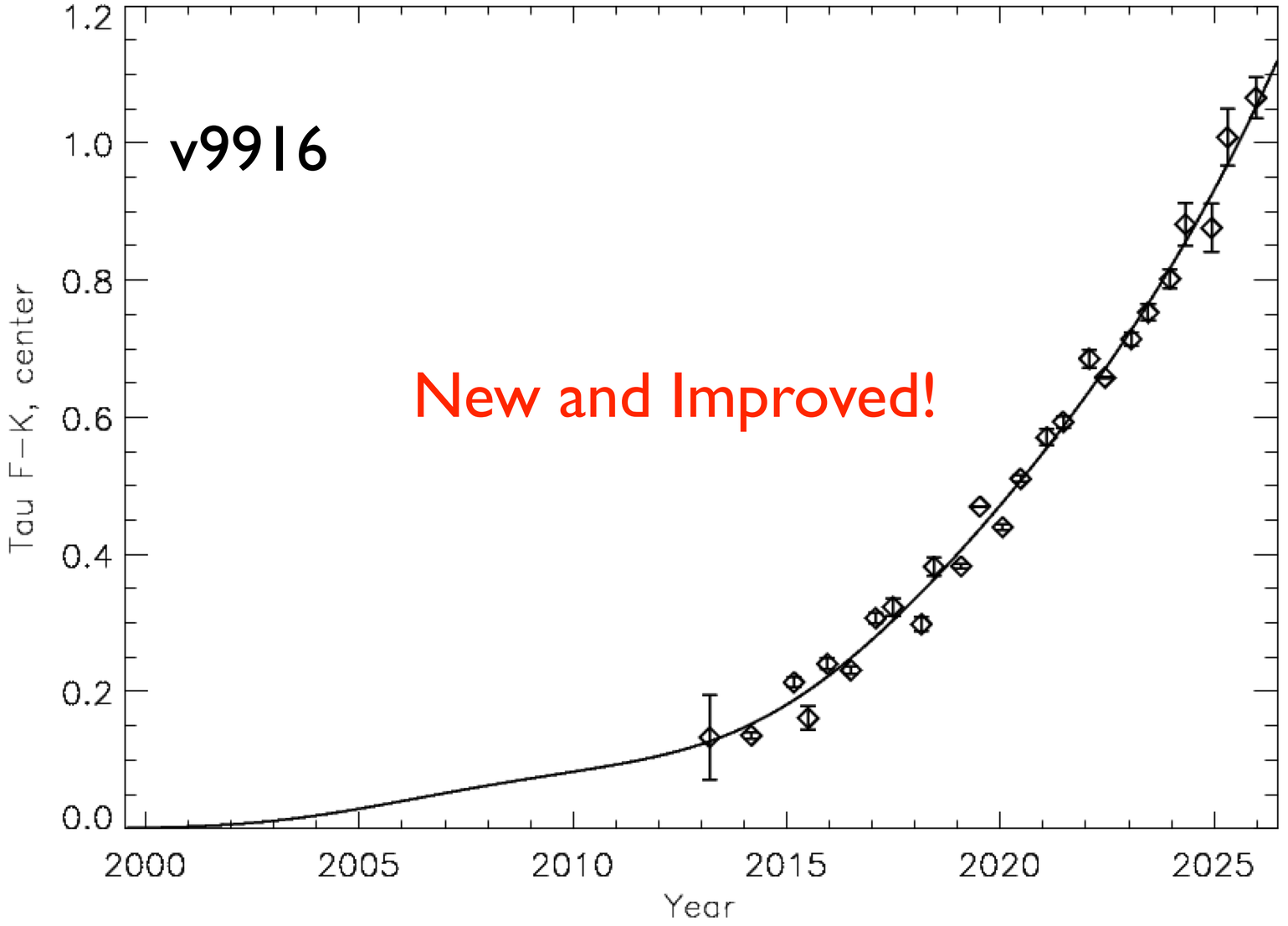
Uniform Part, C-K



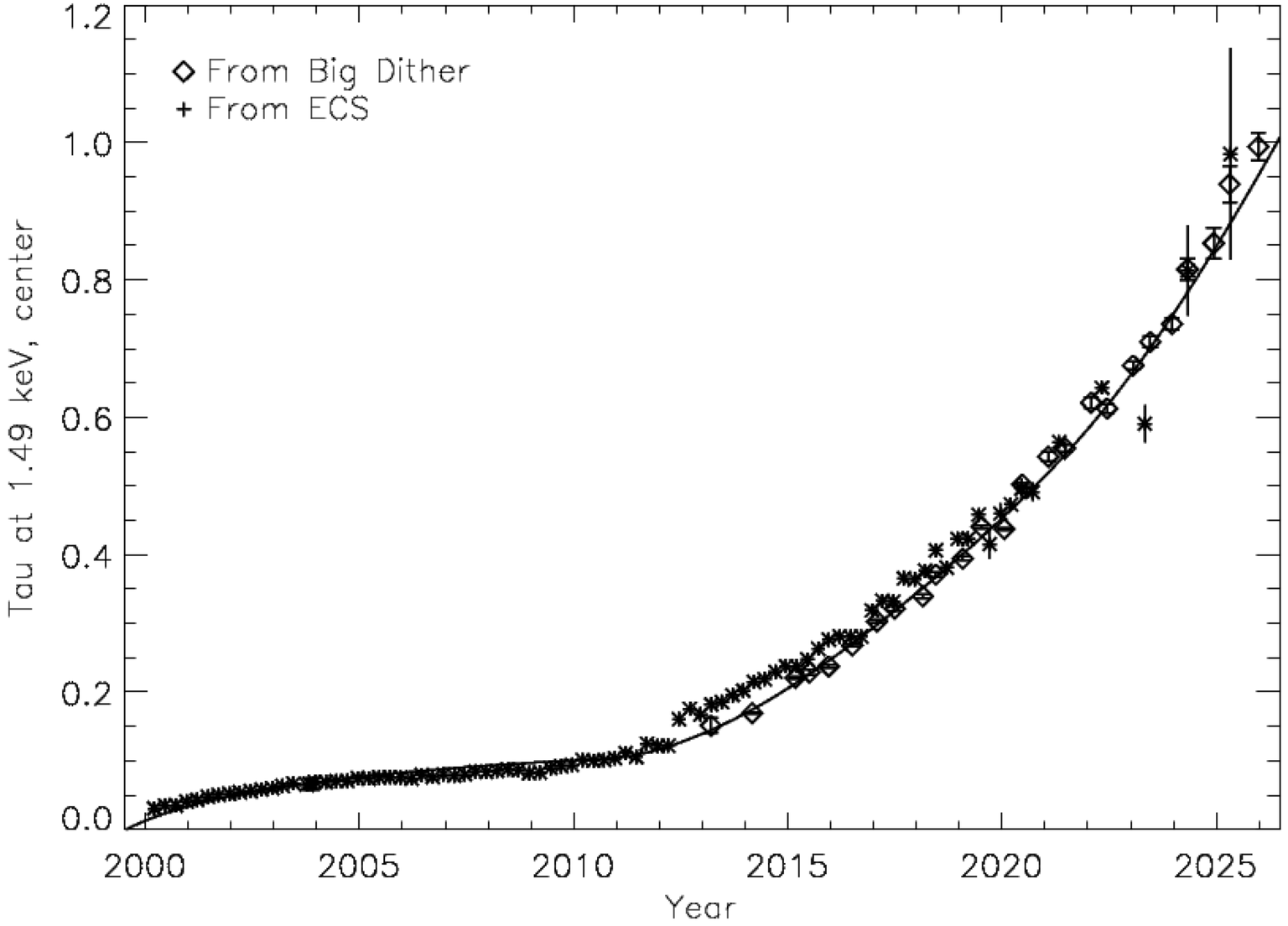
Uniform Part, F-K



Uniform Part, F-K

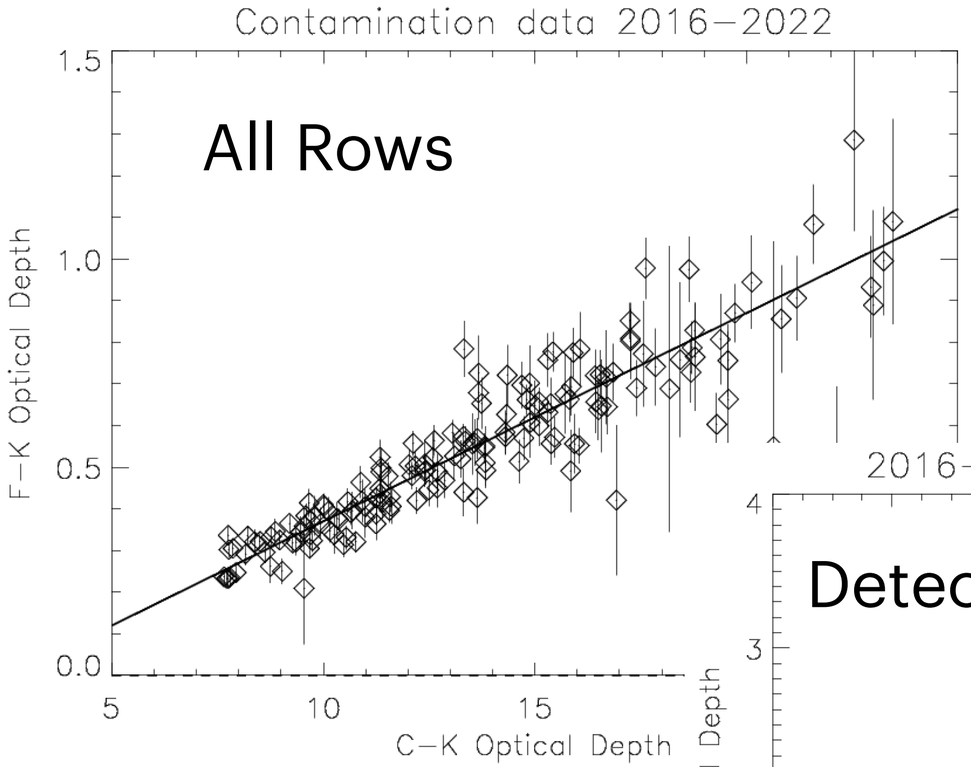


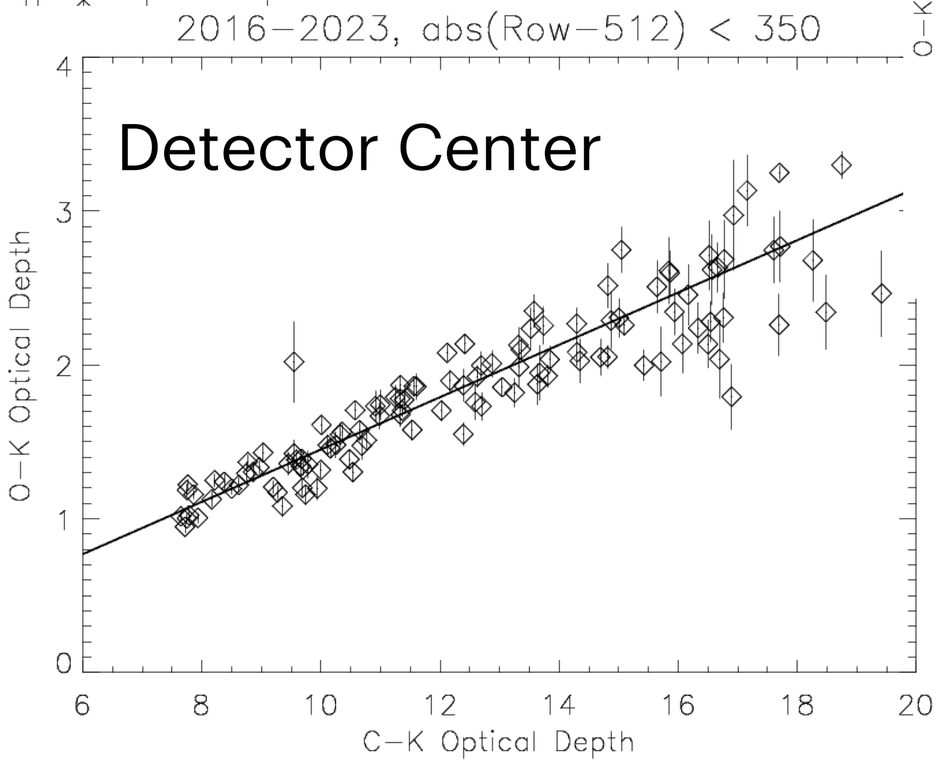
Compare to ECS Al-K

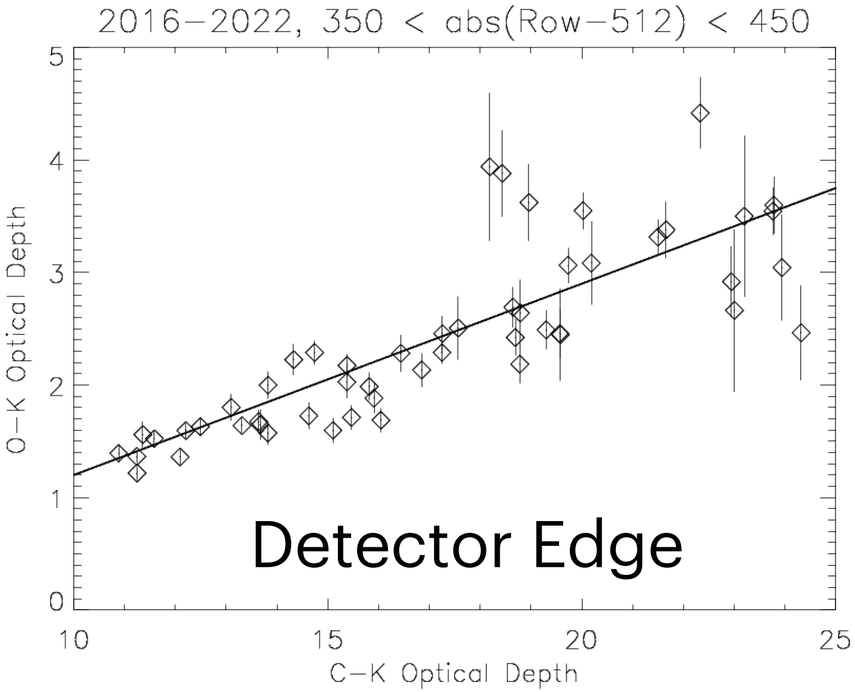


Backup

Tie C-K and F-K Optical Depths





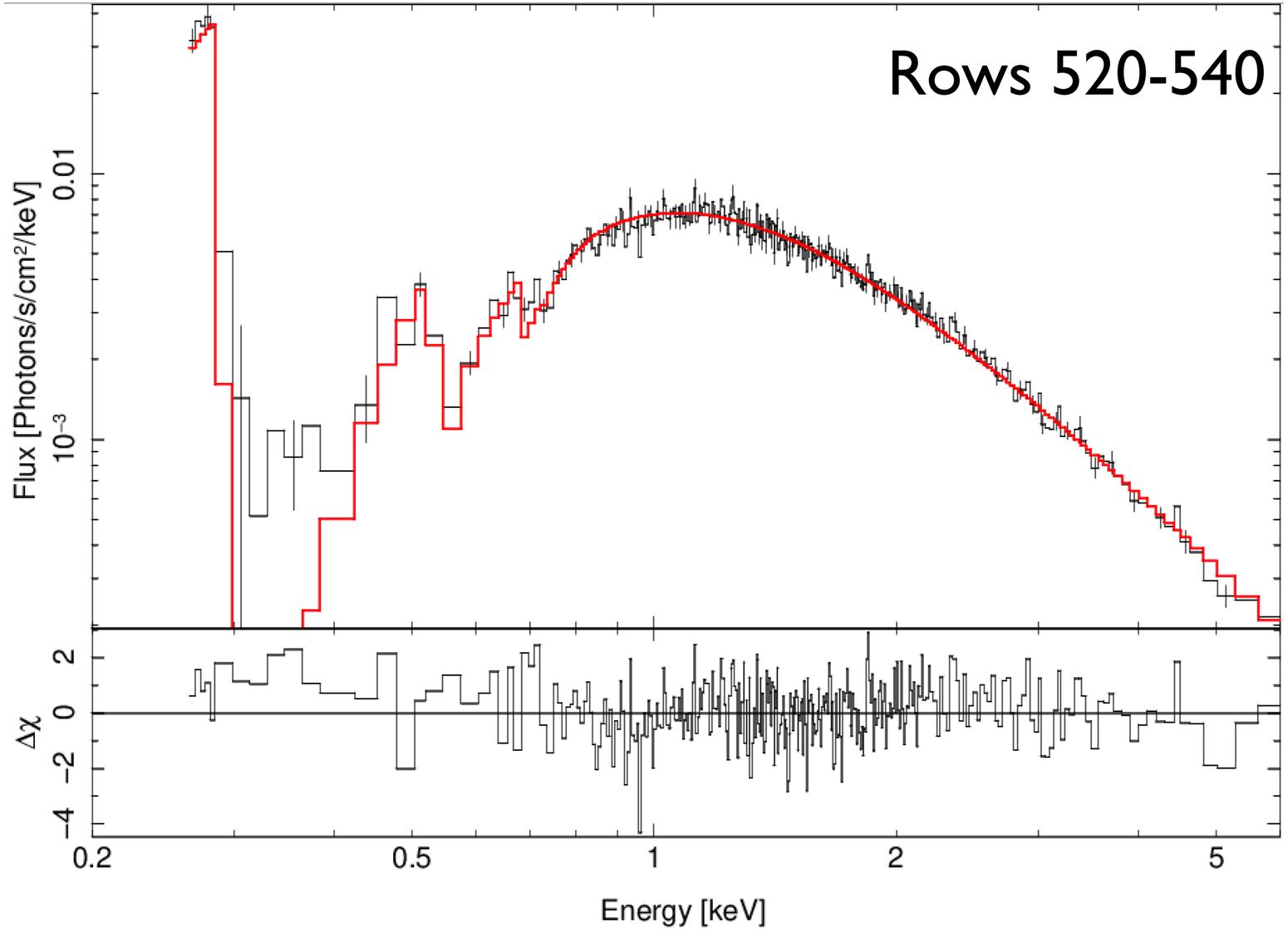


Big Dither Process

- Recent Big Dither Data: 4/2025
  - 60 ks for mid rows (280-512)
  - 120 ks for low rows (20-280)
  - Extract 7 spectra of 50-100 rows each
- Fit C, O, F optical depths in isis
  - Tie γ, β across spectra, where $f_\lambda = n_0 \lambda^{\gamma+\beta \log \lambda}$
- Fit $\tau_X(y) = K_X + N_X \cosh[(y-512)/120]$
  - Shape is close match to actual function
  - X = [C,O,F]
- Plot $\tau_0(t) = K(t) + N(t)$ and $\tau_1(t) = 19.9N(t)$

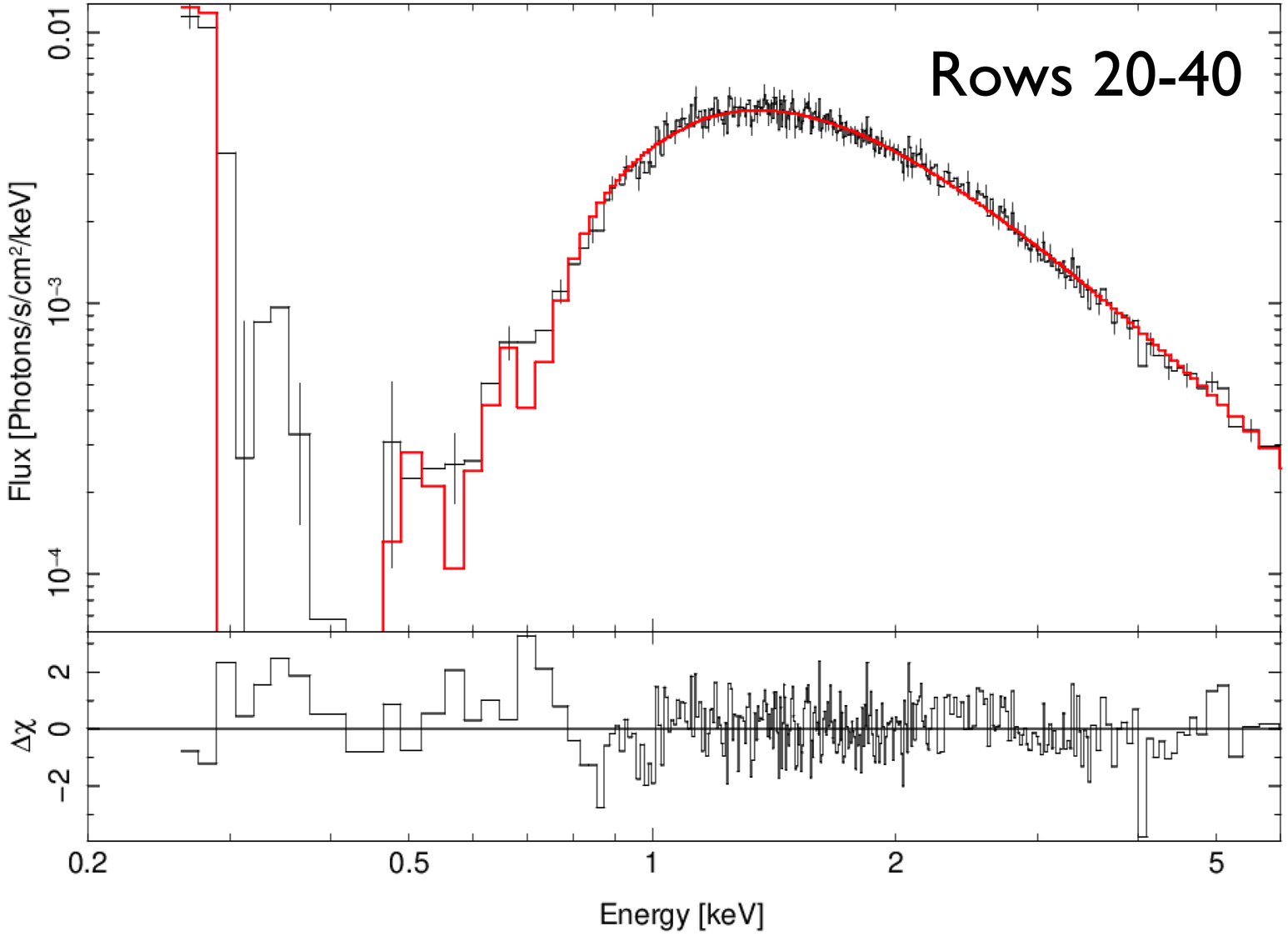
Example Big Dither (LETG/ACIS) Spectra of Mk 421

- Data from 2020
- F-K, O-K are clearly measured
- Good detection below C-K edge
- Center rows have higher signal



Example Big Dither (LETG/ACIS) Spectra of Mk 421

- Data from 2020
- F-K, O-K are **not** clearly measured
- Poor detection below C-K edge
- Edge rows have low signal at edges



Contaminant Thickness

- Center thickness: 2.5 μ
- Edge thickness: 4 μ
- Filter thickness: 0.33 μ