Baseline Science with ASTROSAT: magnetic CVs

V Girish

ISRO Satellite Centre, Bangalore - 17

Magnetic CVs

- Interacting White dwarf binaries with high B
- Two types
  - **Polars**
    B ~ 80-100 MG

    Highly synchronous rotation

  - **Intermediate Polars**
    B ~ 10 MG
    P_{spin}/P_{orb} ~ 0.1
- Accretion follows magnetic field lines
- Cyclotron cooling after shock

ASTROSAT Baseline Science

Search for QPO from CVs

- QPOs are seen in optical
- One very weak signal in RXTE data, no confirmed QPO till
- LAXPC with 4 times larger area

Confirmation of X-RAY QPOs in CVs?

- If confirmed

  Optical and X-ray connection

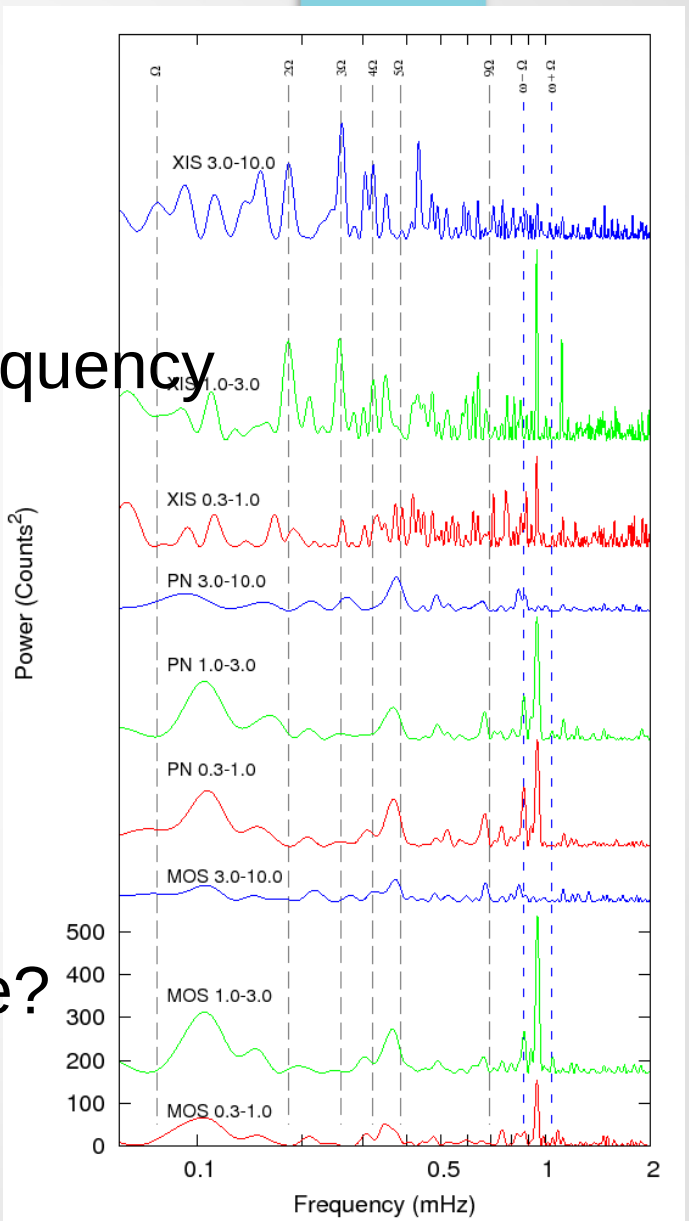
  Linkage with QPOs from other compact objects

Disc-less versus Disc-fed accretion in IPs

SXT Timing

- Disc-less Geometry (rare)
  signal at spin, first and second beat frequency
  (ω, ω-Ώ, 2ω-Ώ)
- Disc-fed Geometry
  Only spin frequency component

- Can we resolve this using UV lightcurve?



Hard X-ray emitting CVs discovered by INTEGRAL

- Many discovered by INTEGRAL (ASTROSAT CZTI?)
- Mainly Intermediate polars
- Properties are not well known
- X-ray timing and spectral information from LAXPC & SXT
- UV timing ++

Two Types of Spectra

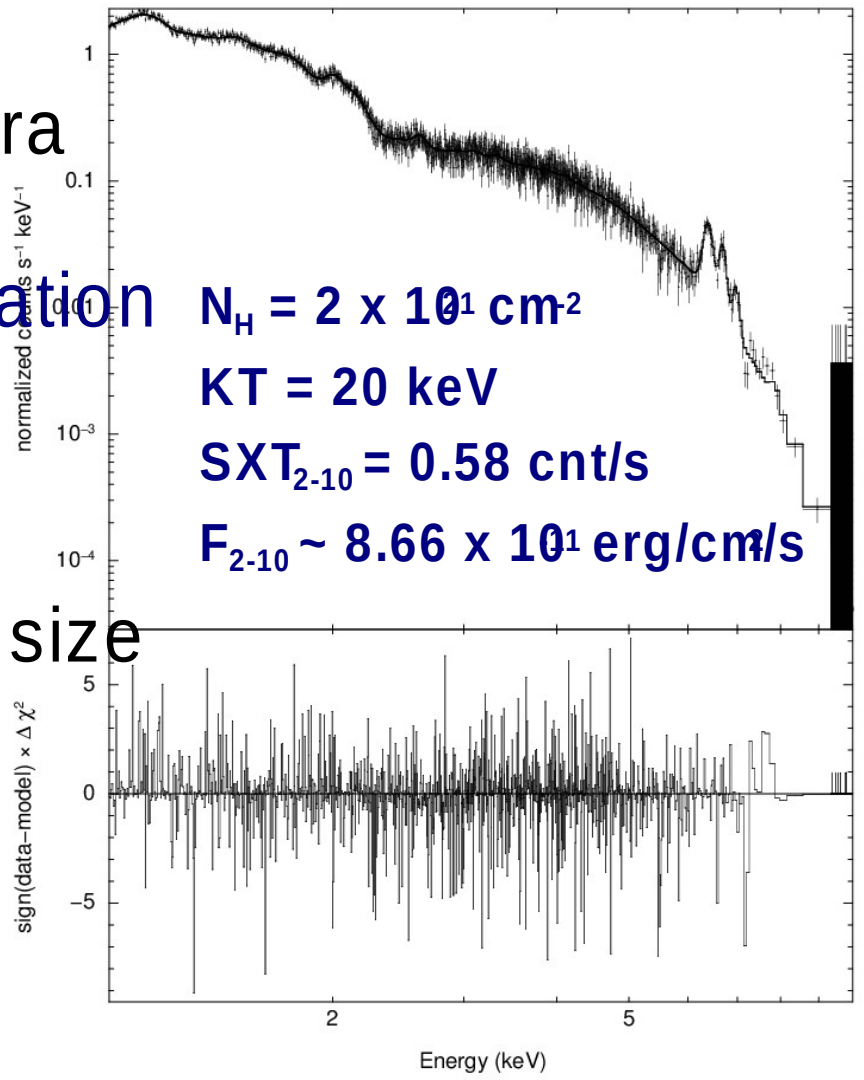
Spectroscopy from SXT

- CVs show two types of spectra

  (Mukai et al.)

  Cooling flow and Photo-ionization
- Magnetic & Non-magnetic
  (except Ex Hya)
- Can we increase the sample size
  (only 7) ?

Phabs * (mkcflow+gauss)



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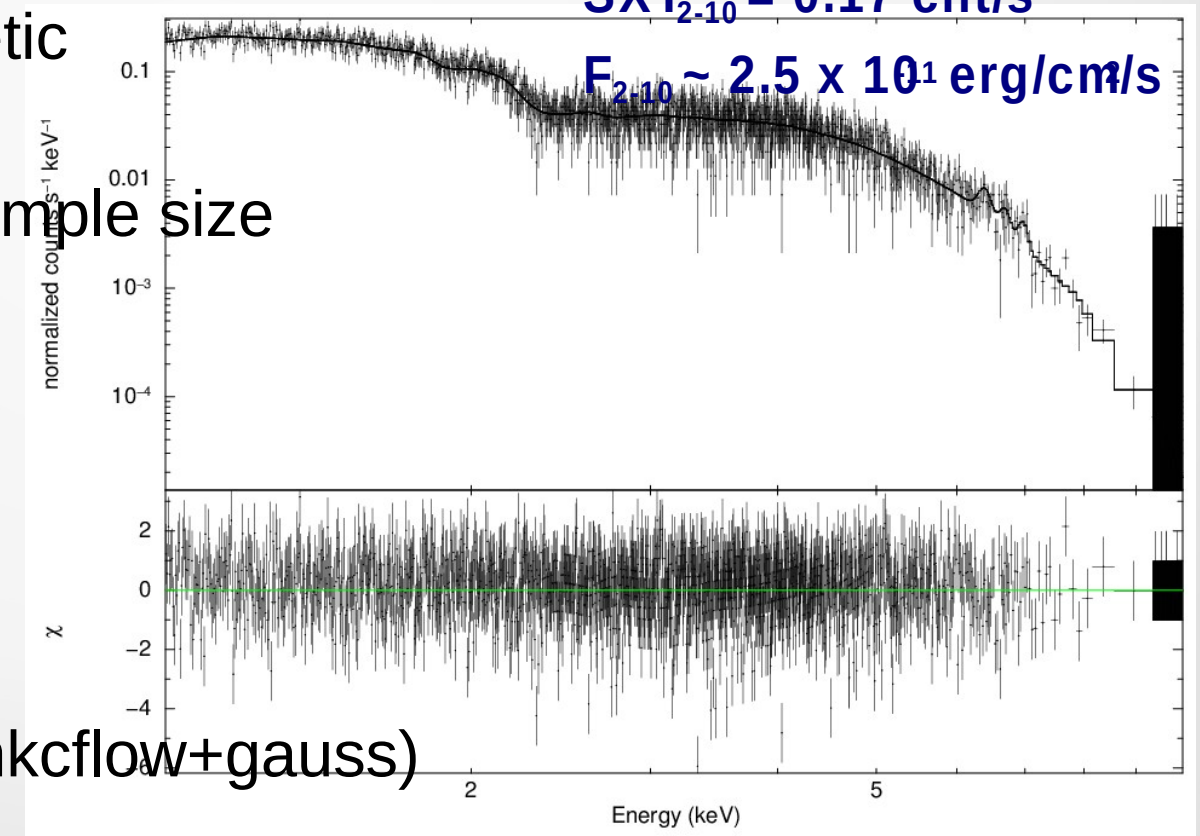
$N_H = 1.1 \times 10^{21}$ cm^{-2}

KT = >80 keV

$SXT_{2\text{-}10} = 0.17$ cnt/s

$F_{2\text{-}10} \sim 2.5 \times 10^{-11}$ erg/cm^2/s



phabs * pcfabs(apec+mkcflow+gauss)

Soft X-ray excess and UV?

SXT Spectra

- Partial covering absorption ?
- UV spectral information can provide clues?

Thanks