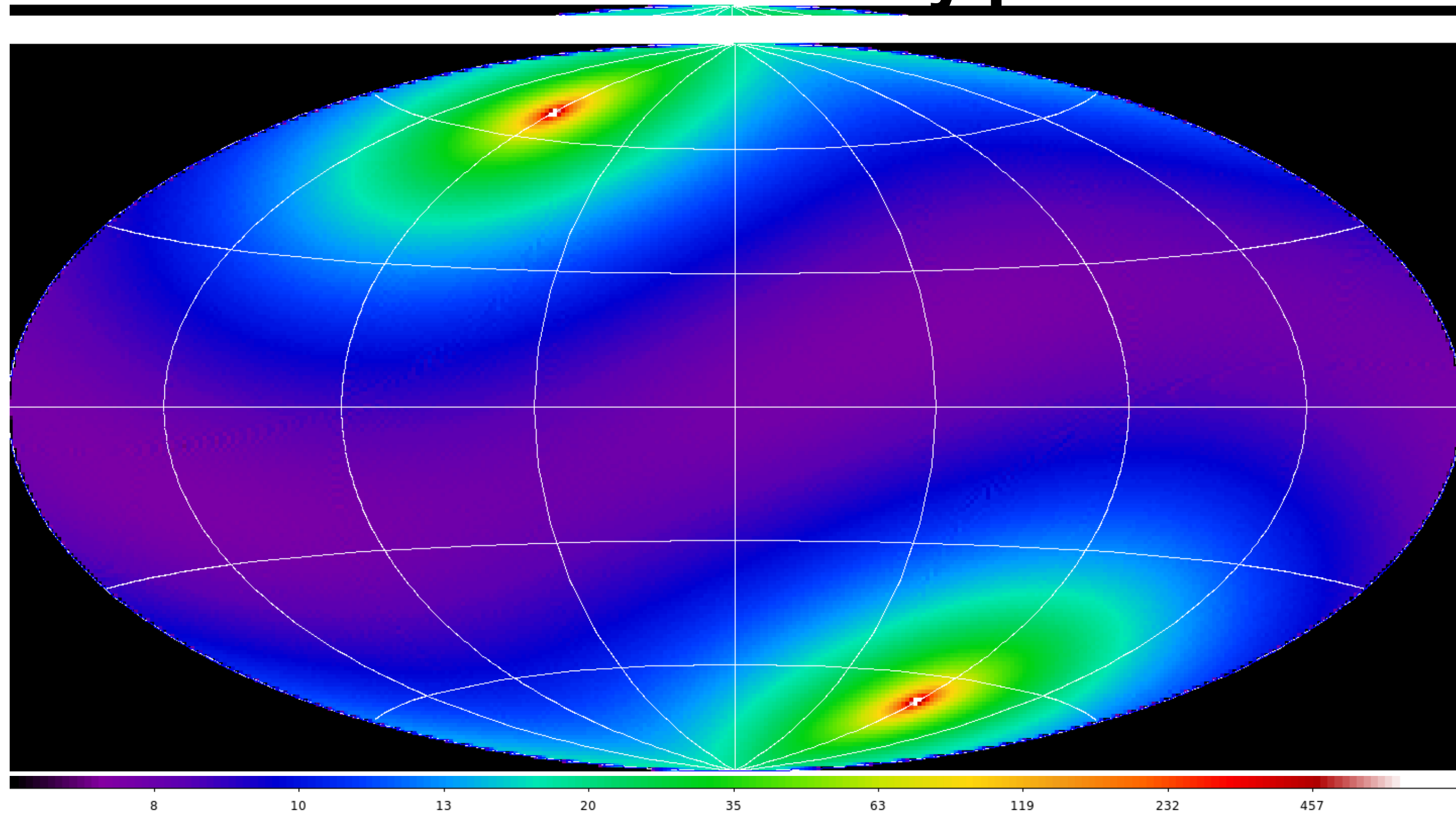


# SRG in the era of TDA & MMS

Arne Rau (MPE)

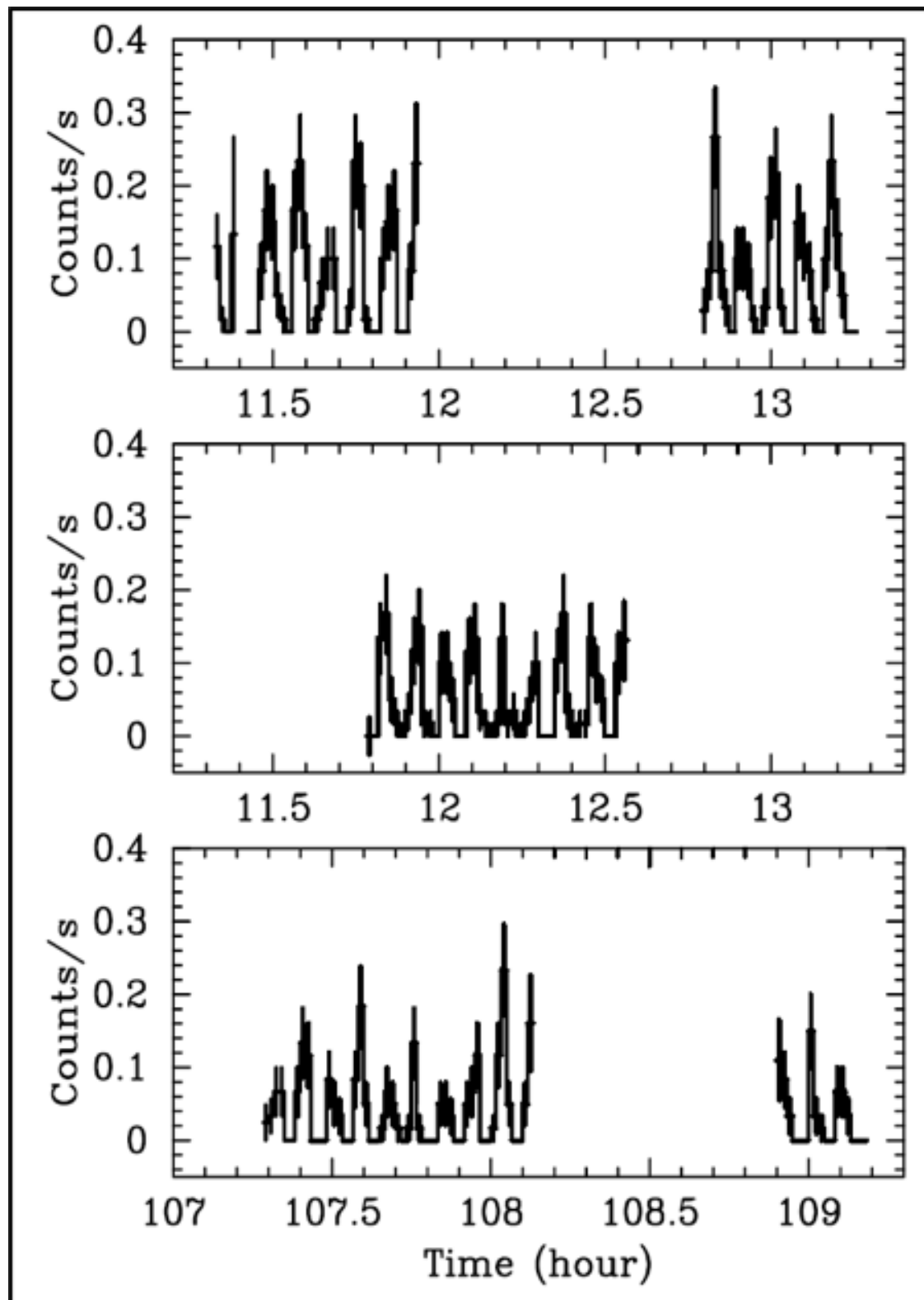
# eROSITA: visits at sky position



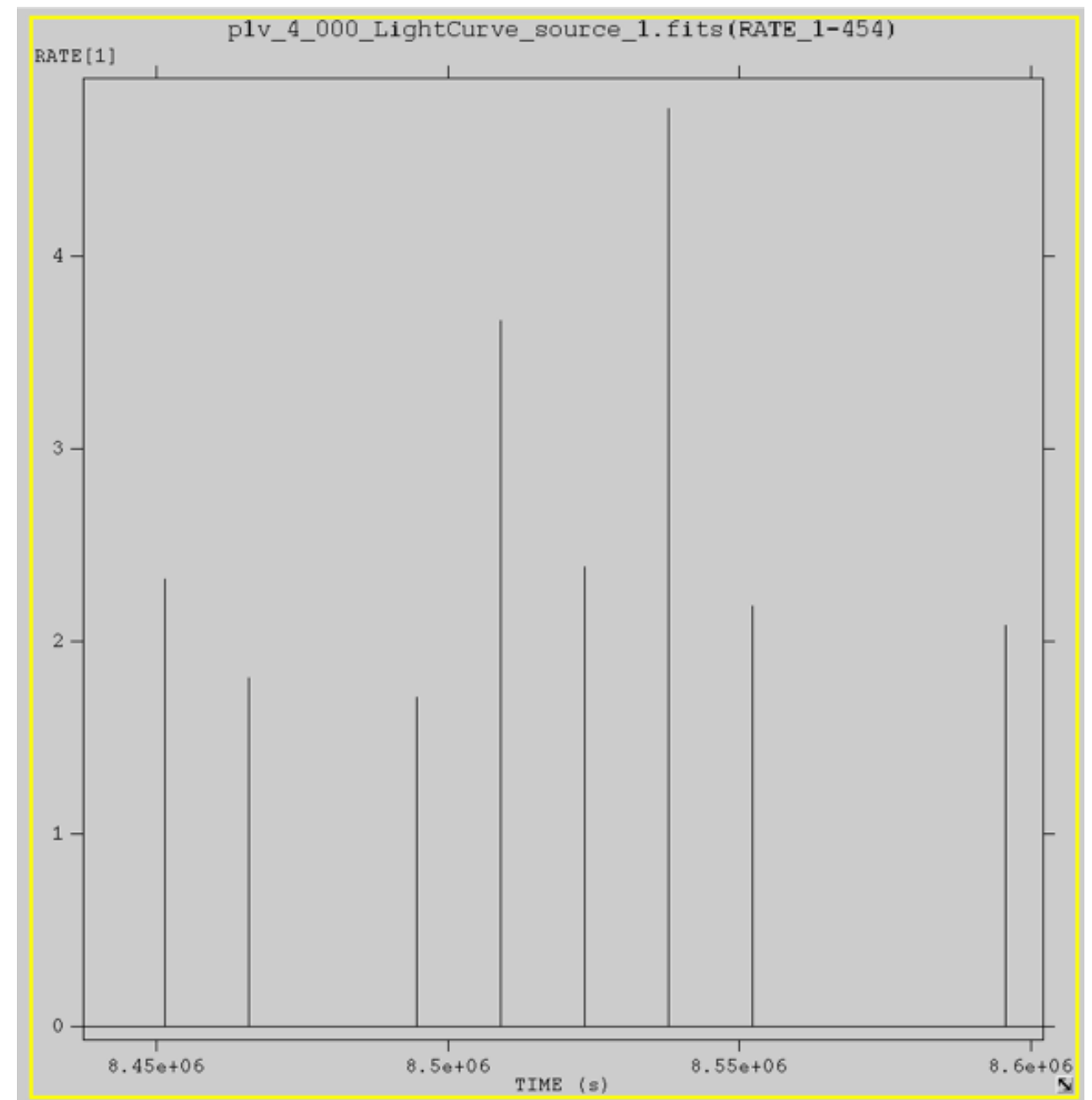
- 8-500 visits within 4yr
- each visit consists of ~6 subsequent passes with ~40s exposure every 4hrs
- probing timescales: 40s, 4h, 1d, 180d, ..., 4yr

# White Dwarf Accretors (e.g., AM CVn)

HMCnc ( $P_{\text{orb}}=5.4\text{min}$ ) with ROSAT...

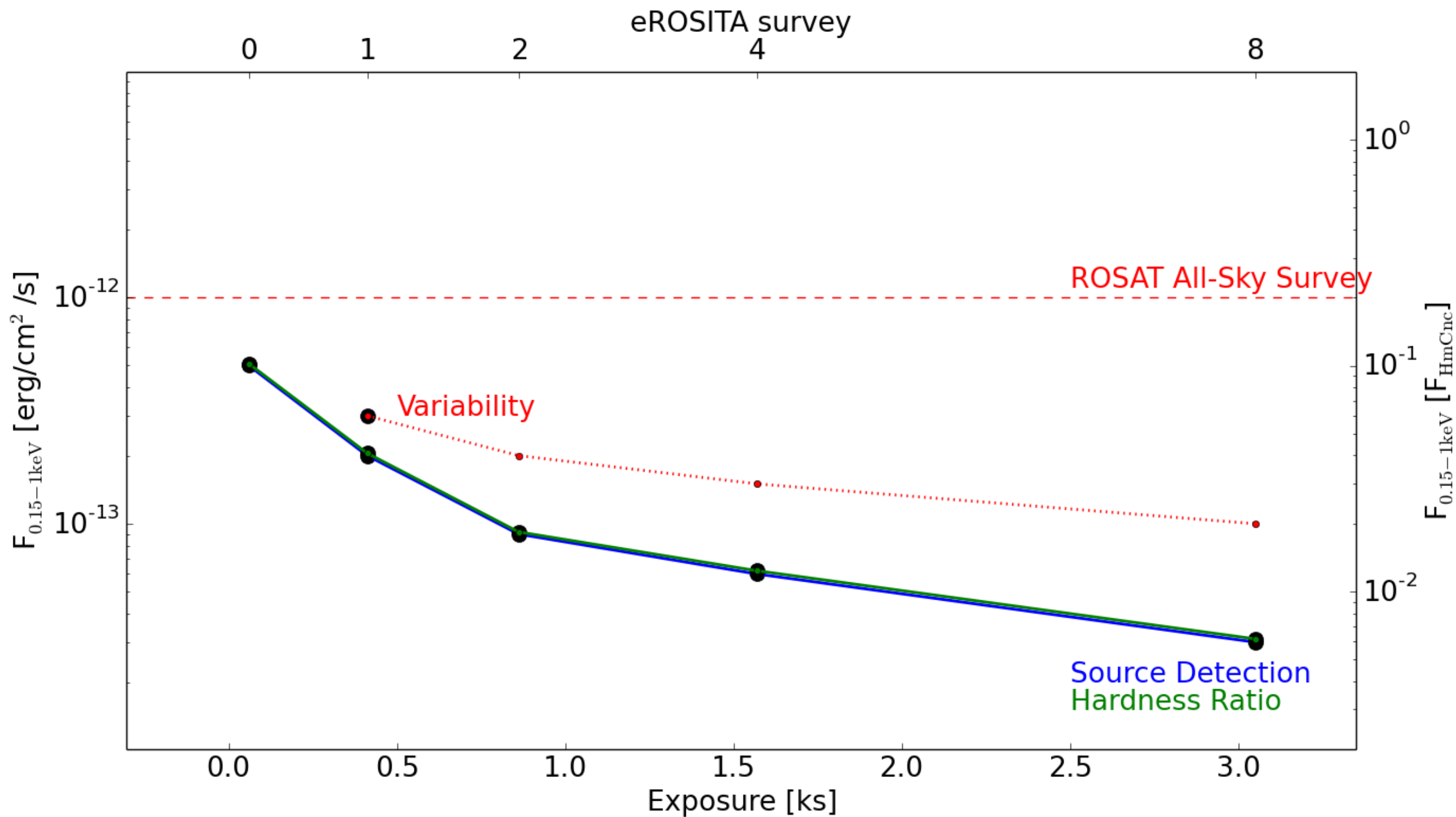


... in subsequent  $\sim 4\text{hr}$  cadence eRASS passes



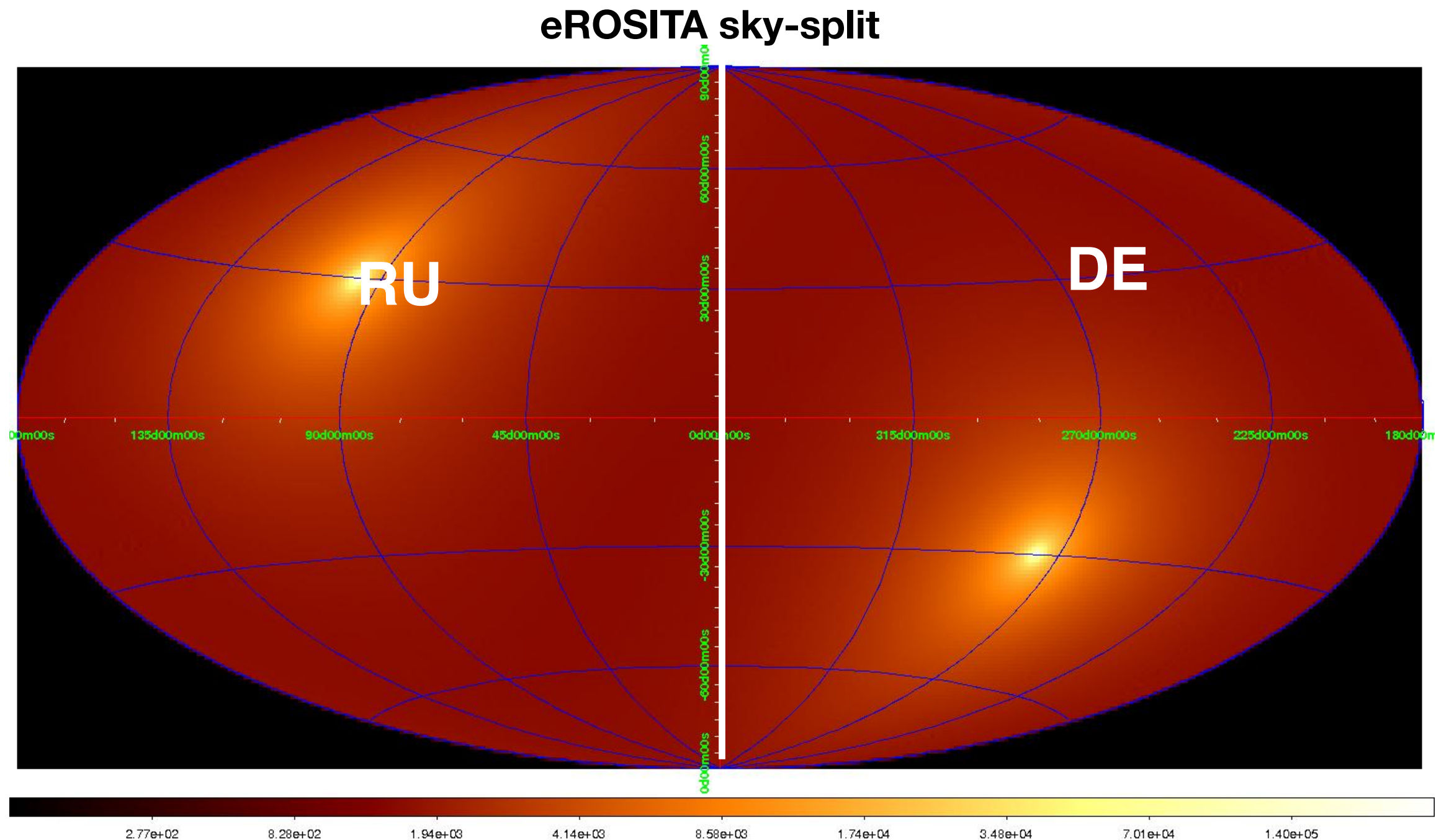
(Israel et al. 1999)

To which flux limit will eROSITA detect (and select) RXJ0806-like sources in eRASS 0,1, 2, 4 & 8?



# SRG: politics

ART-XC (4-160keV): Russia owns data rights over entire sky  
eROSITA (0.3-10keV): data rights split evenly between Germany (West in Gal. Coord.) and Russia (East). —> 2 separate consortia, little collaboration foreseen at the moment.



# eROSITA data release policy

- **DE part:**
  - 1/2yr, 2yr(?), 4yr all-sky source catalog
  - transients on best effort
- **RU part:**
  - undefined

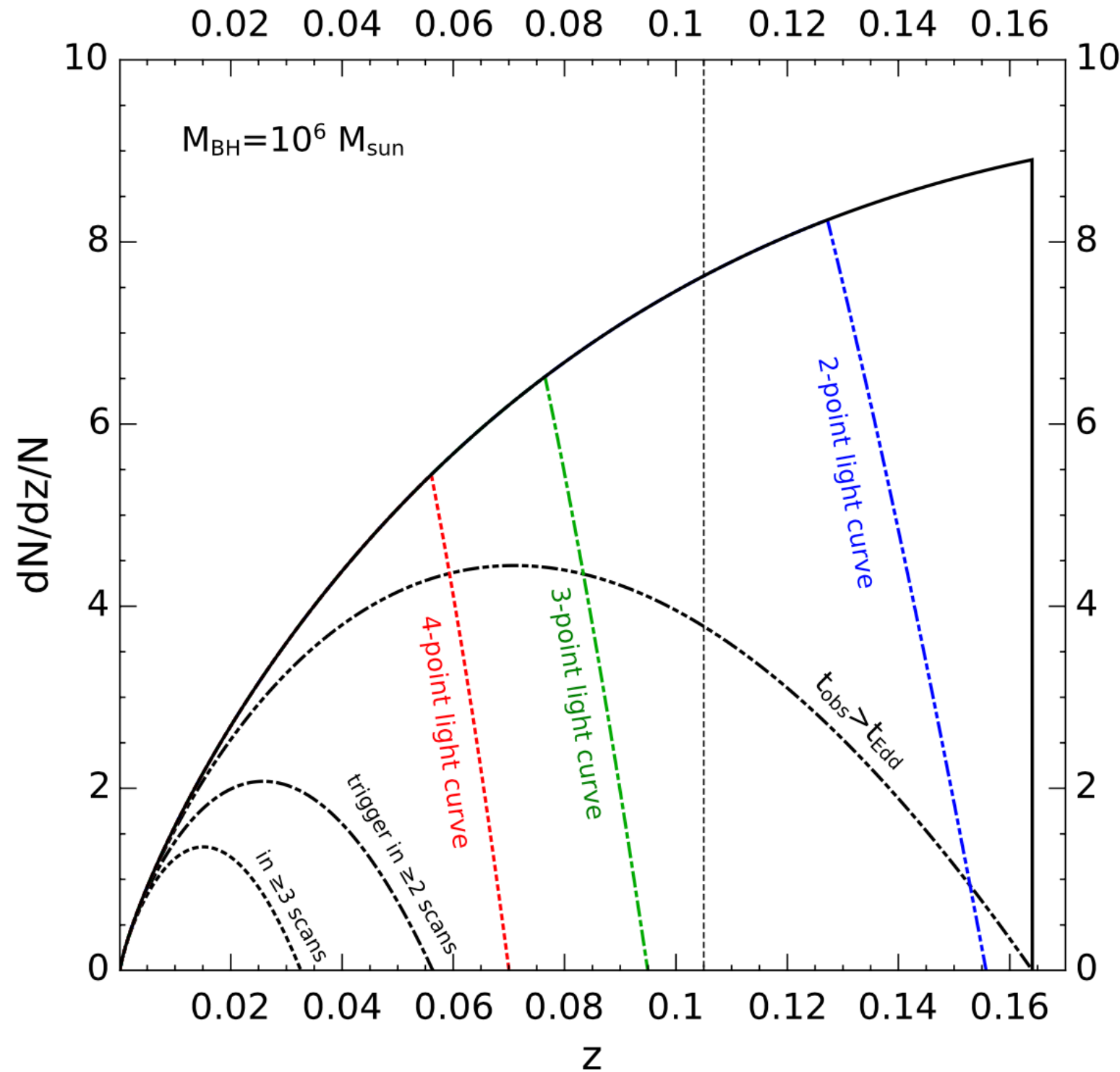
# eROSITA\_DE: collaboration opportunities

- **Individual External Collaborations** to make proposal for well-define project to Science Working Group Chairs (TDA: A.Rau, J.Wilms)
- **Group External Collaborations** for larger facilities through team-to-team MoUs (e.g., Hyper Supreme Cam, SDSS IV)

External collaborations with both, DE and RU, **not** allowed.

# Tidal Disruption Flares

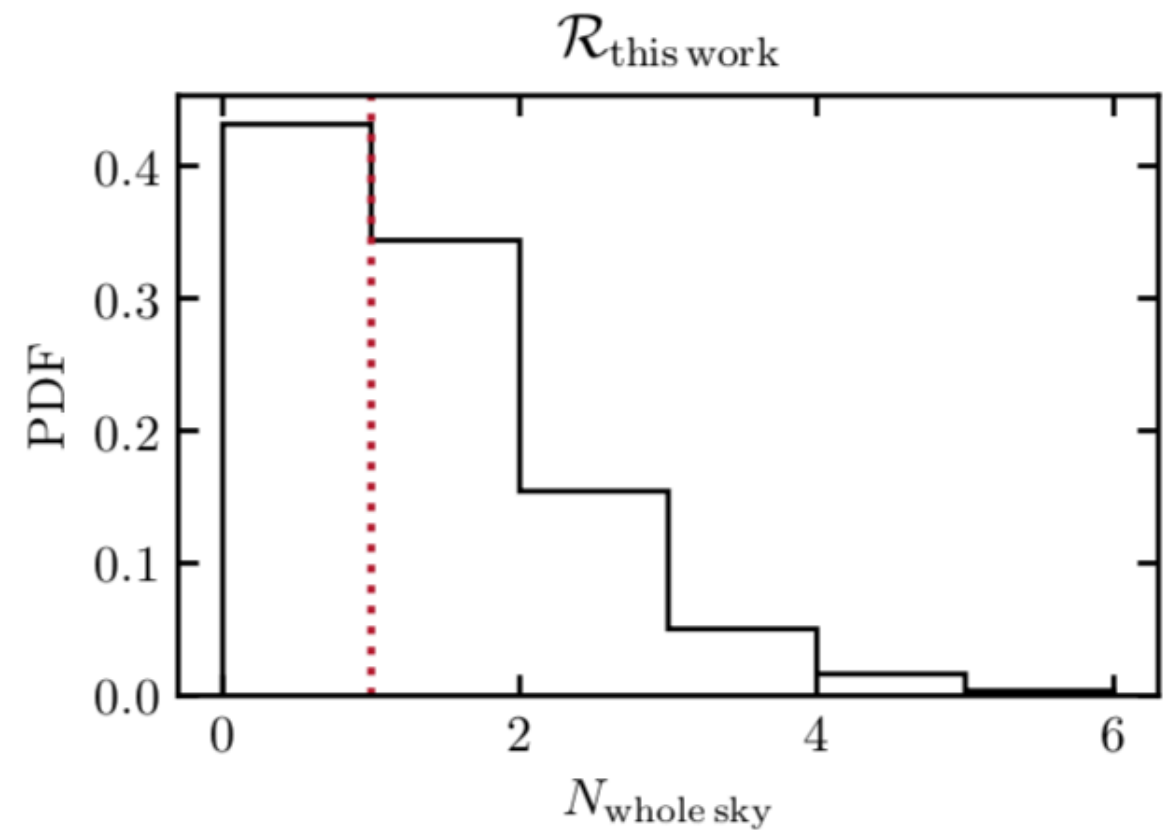
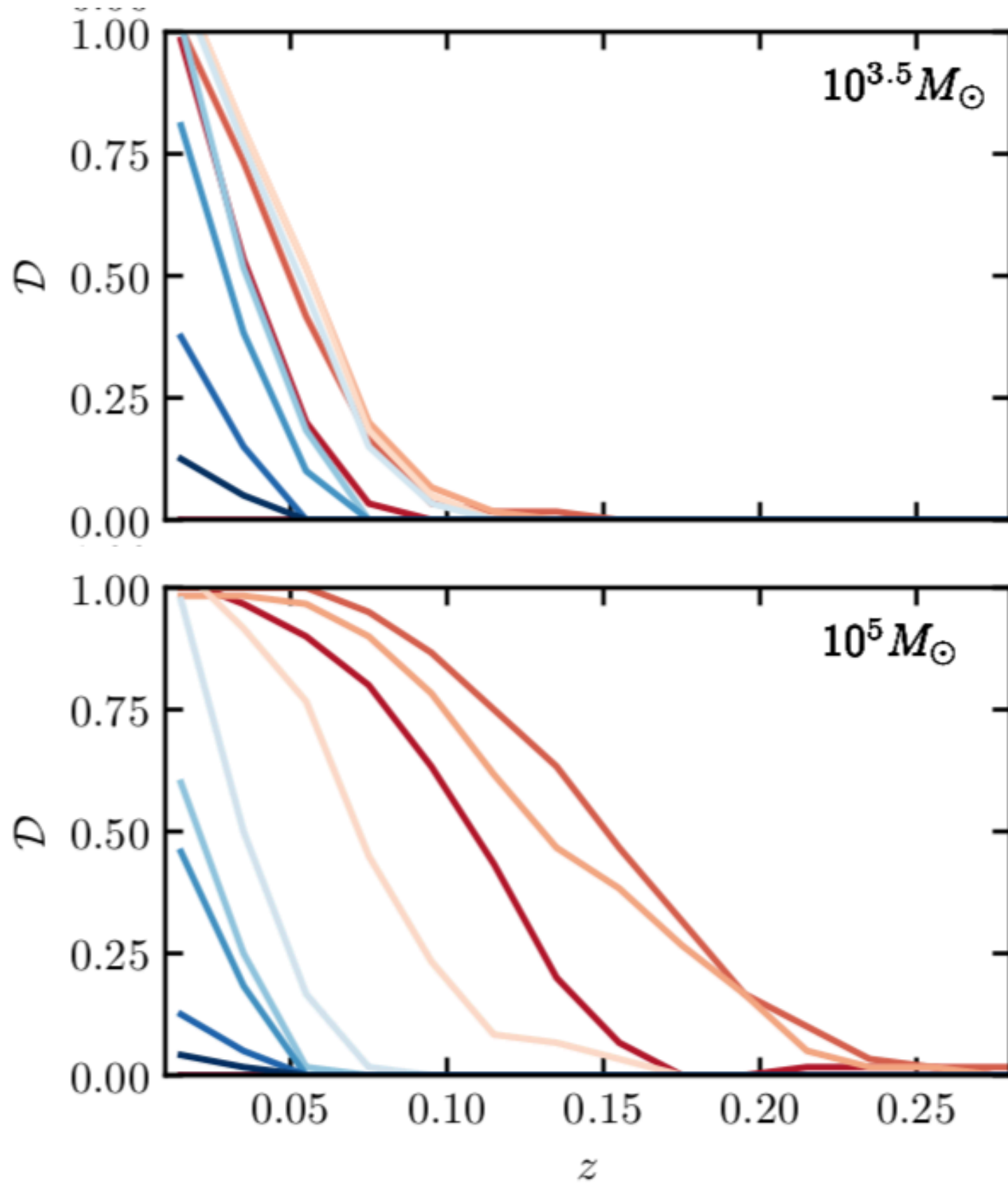
Khabibullin et al. (2014)  
(also: Thorpe et al. 2019)



- ~125 TDEs (all-sky) by comparing eRASS1 with RASS
- ~650 TDEs (all-sky) by comparing eRASS2 to eRASS1, eRASS3 to eRASS2, etc
- typically visible for 2-4 eRASS



# Detection Efficiency for IMBH WD TDE



(Malyali et al. submitted)

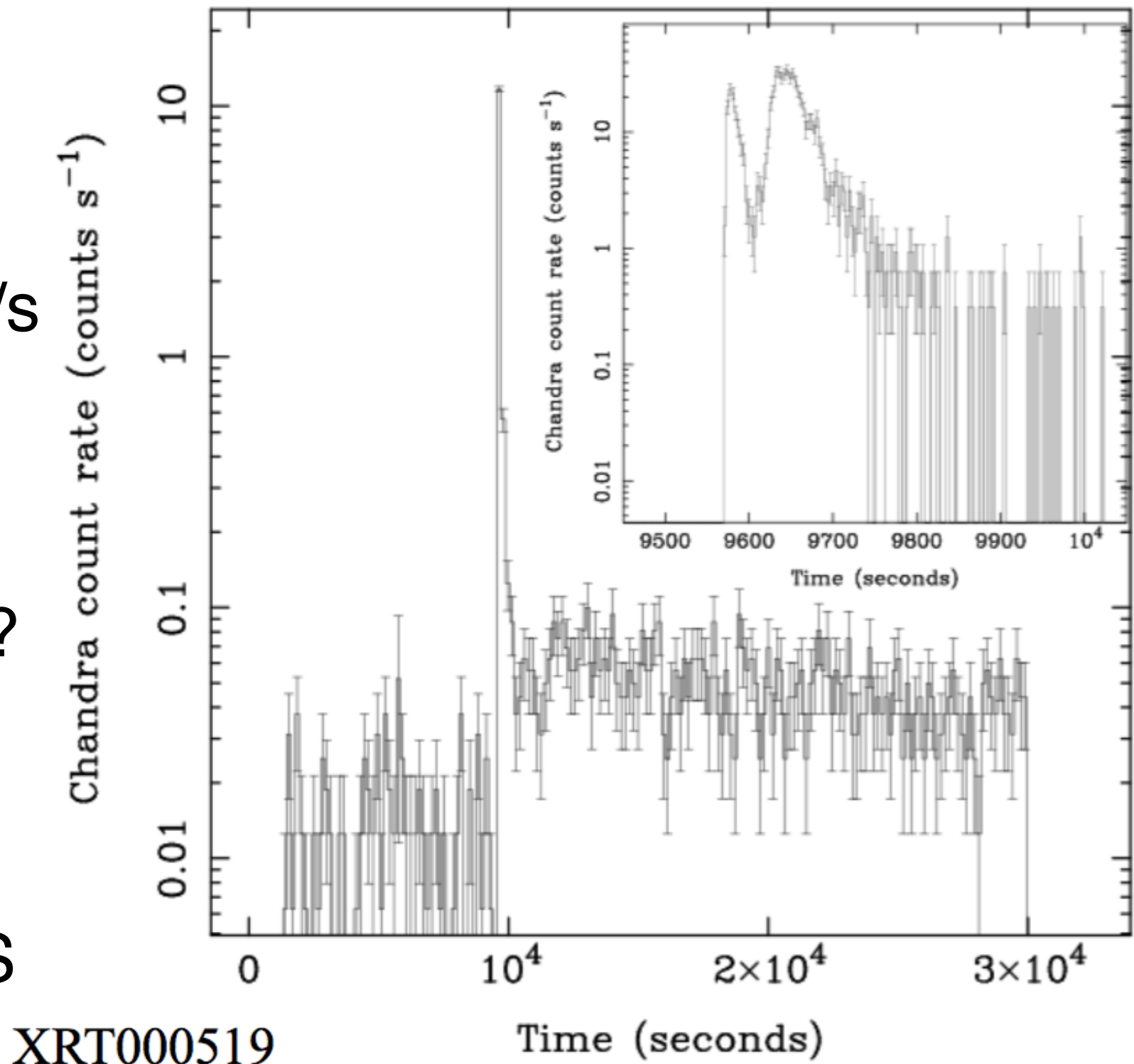
# Fast X-ray transients - TDEs of WDs around IMBHs?

## XRT000519:

- Chandra detection
- near M86
- $F_{\text{peak}} = 2 \times 10^{-10} \text{ erg/cm}^2/\text{s}$
- $L_{\text{peak}} = 6 \times 10^{42} \text{ erg/s}$
- $i \sim 26 \text{ mag}$  1yr later
- absorbed powerlaw
- $10^4$  BH disrupted WD?

## Rates:

- $10^5$  all-sky  $\text{yr}^{-1}$
- $\sim 1$  event  $\text{d}^{-1}$  in eRASS



(Jonker et al. 2013, Glennie et al. 2013)

# eROSITA\_DE and MMS,+

- **In place:**
  - SDSS V, 4MOST (4m, 2400 fibers, start 2022)
  - JPASS (2.5m, 59 filters, 7 squ. deg. FoV)
  - GROND (2.2m, 7-band sim., 4'x4' FoV)
- **Needed:**
  - single-slit spectrograph (or SEDM)
  - wide-field optical monitor for shadowing
  - wide-field optical variability monitoring (and reference) for verification, classification, and follow-up