ASASSN-17gs - awakening of a dormant blazar by a tidal disruption event?

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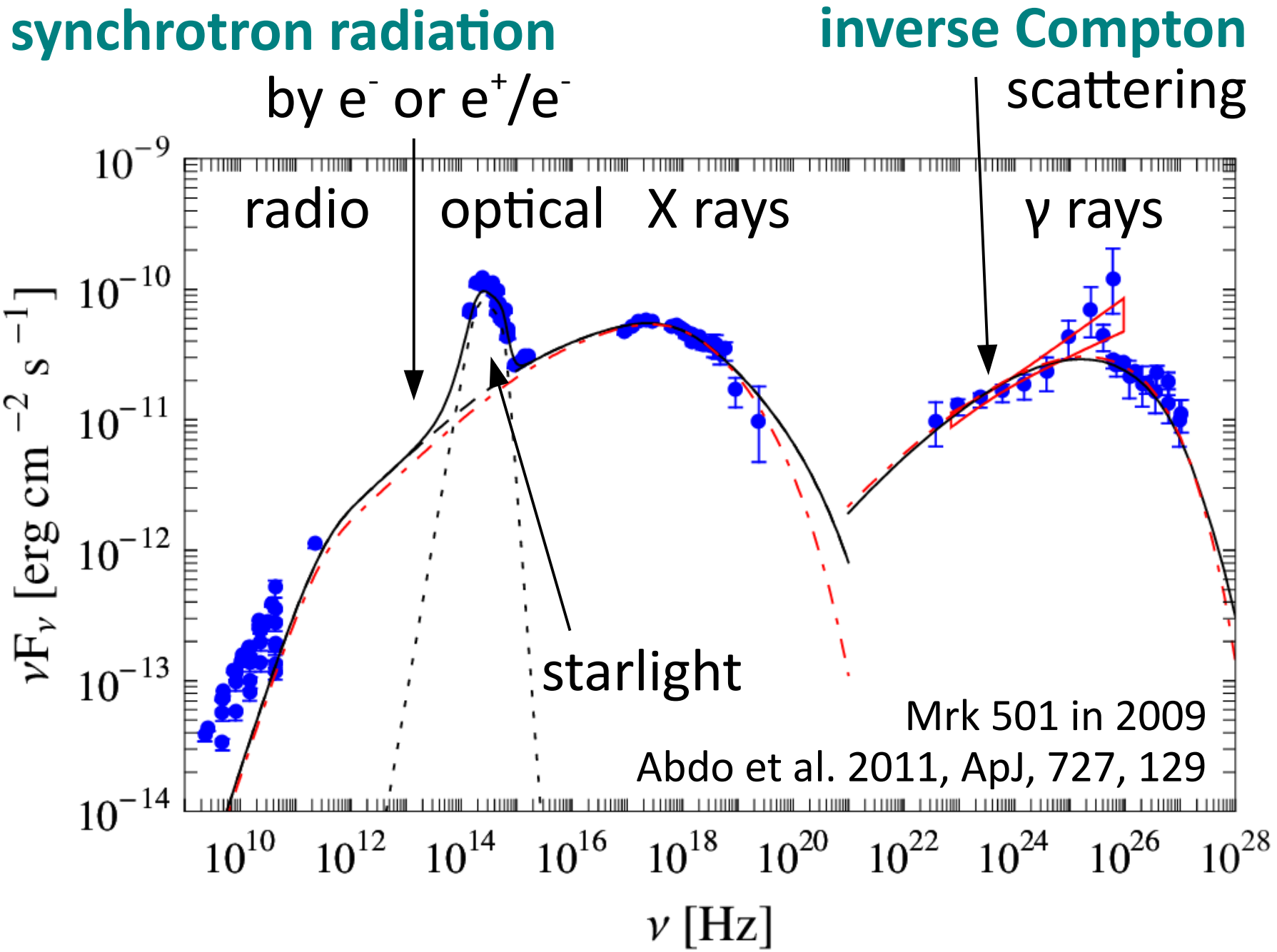
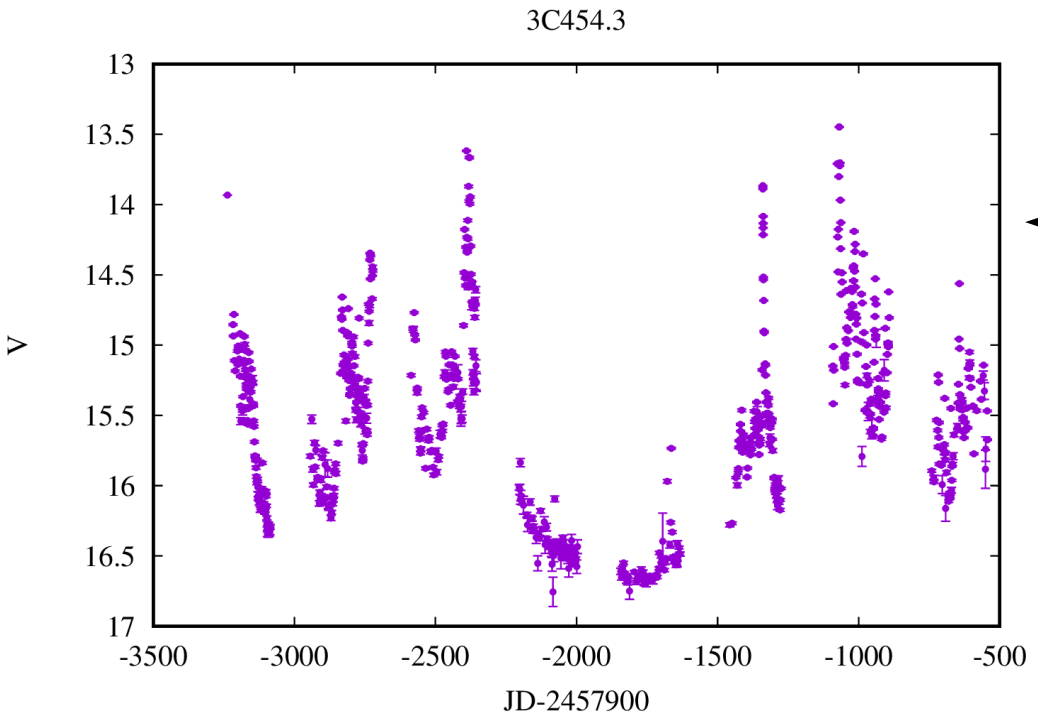
a preliminary report on behalf of a larger collaboration of observers

Blazar emission mechanisms



Example blazar lightcurves

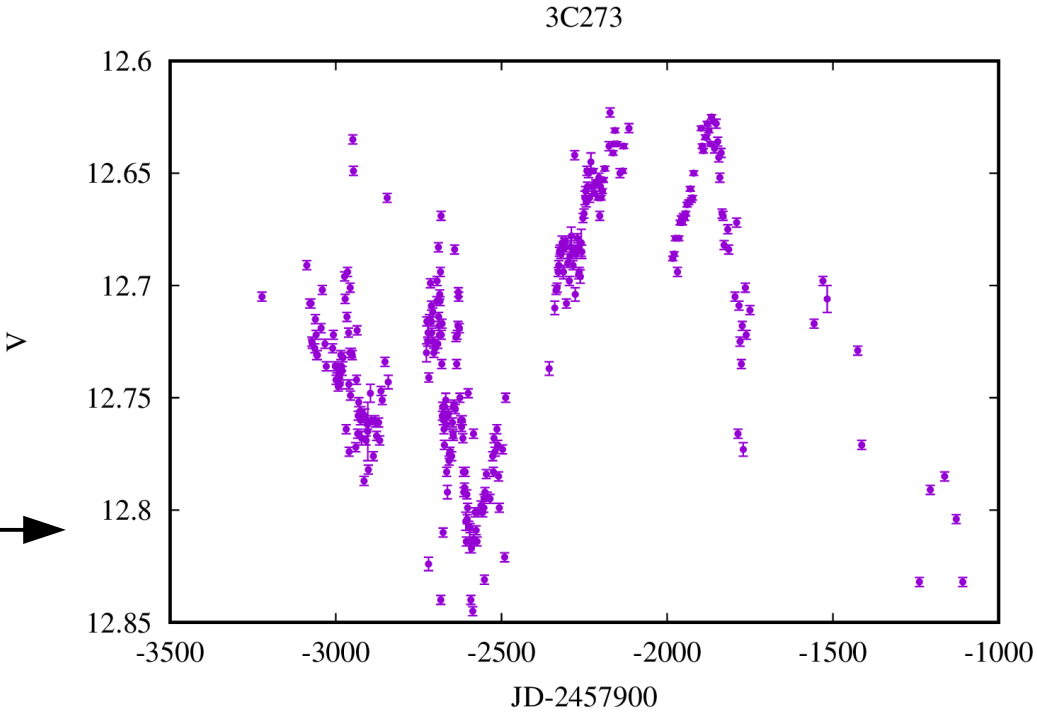


Jet dominates optical light

Flares

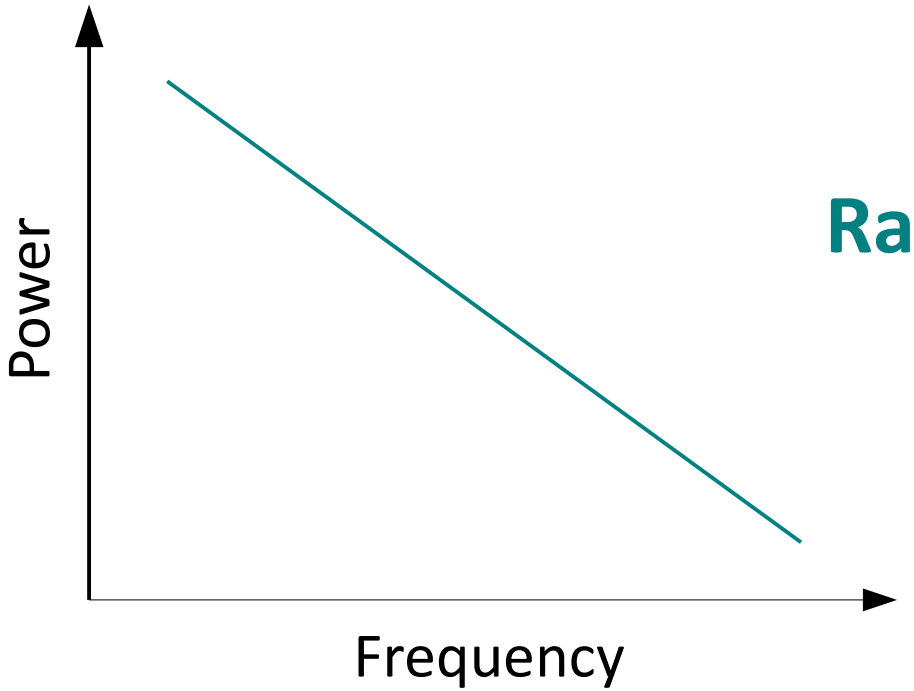
Jet contribution comparable to other AGN components

Slow irregular variations



SMARTS monitoring data by Bonning et al. 2012, ApJ, 756, 13

Power spectra

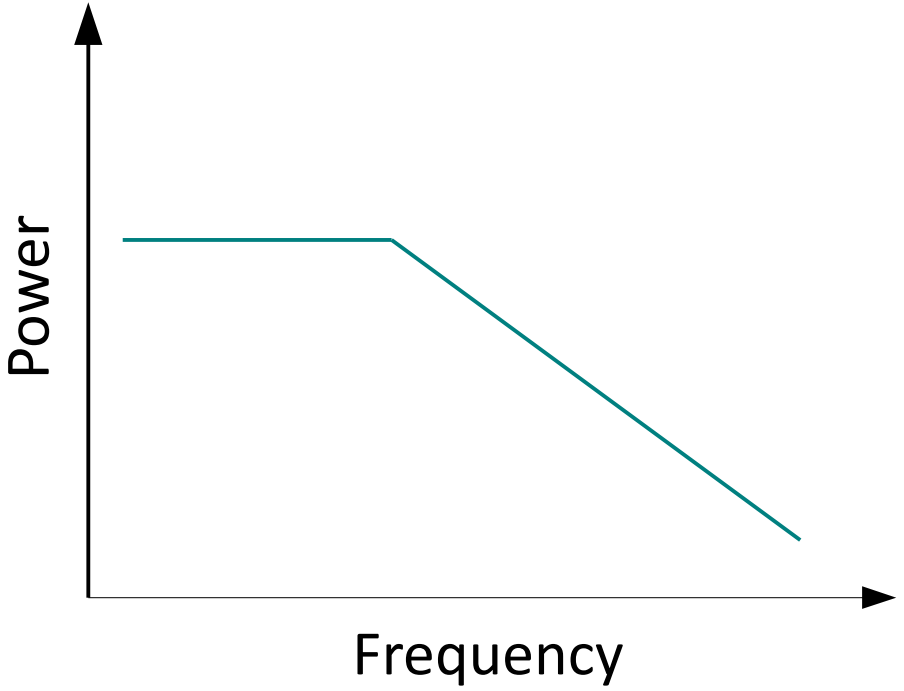


Jet dominates optical light

Random walk - no amplitude limit

Jet contribution comparable to other AGN components

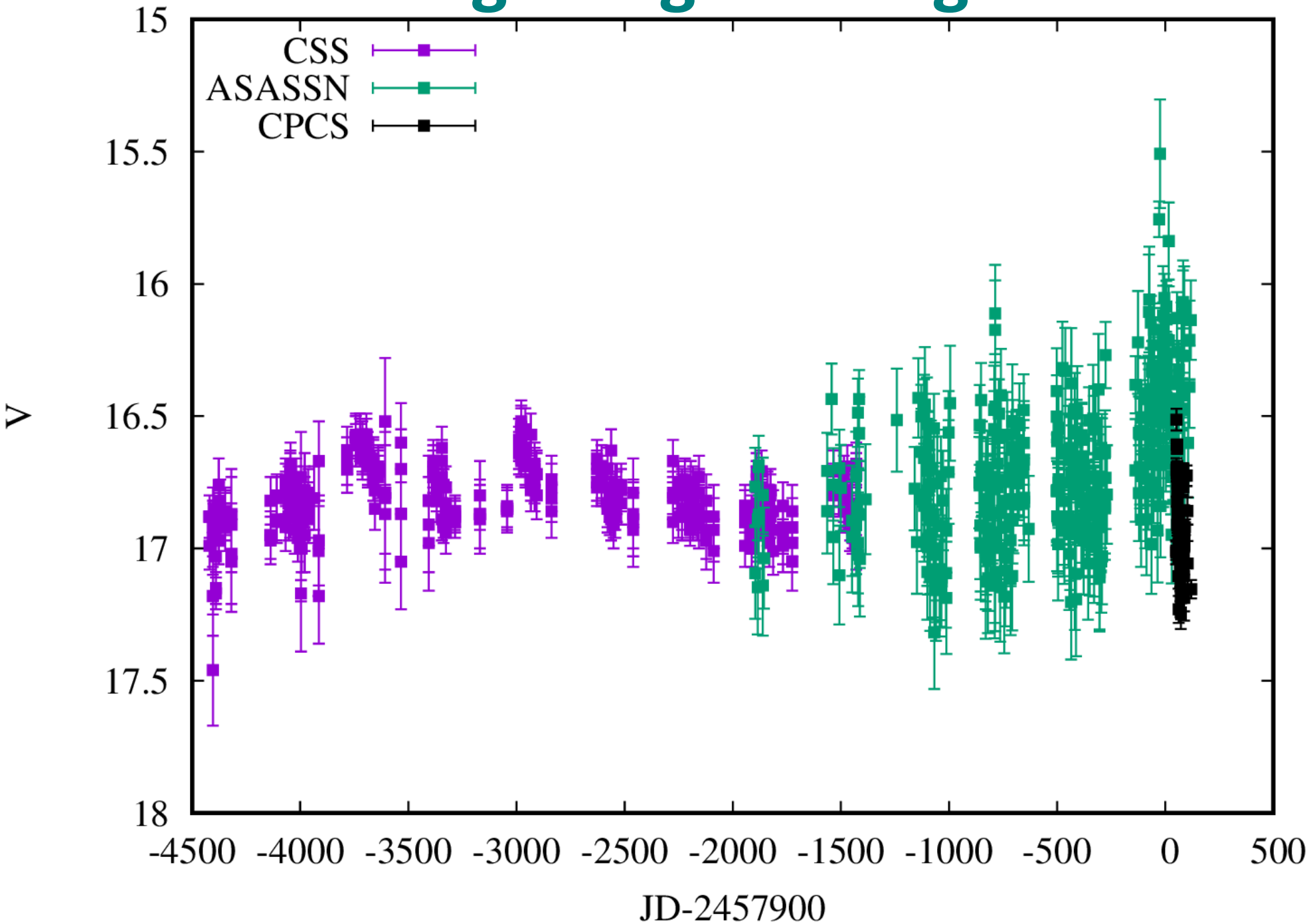
Damped random walk - limited amplitude



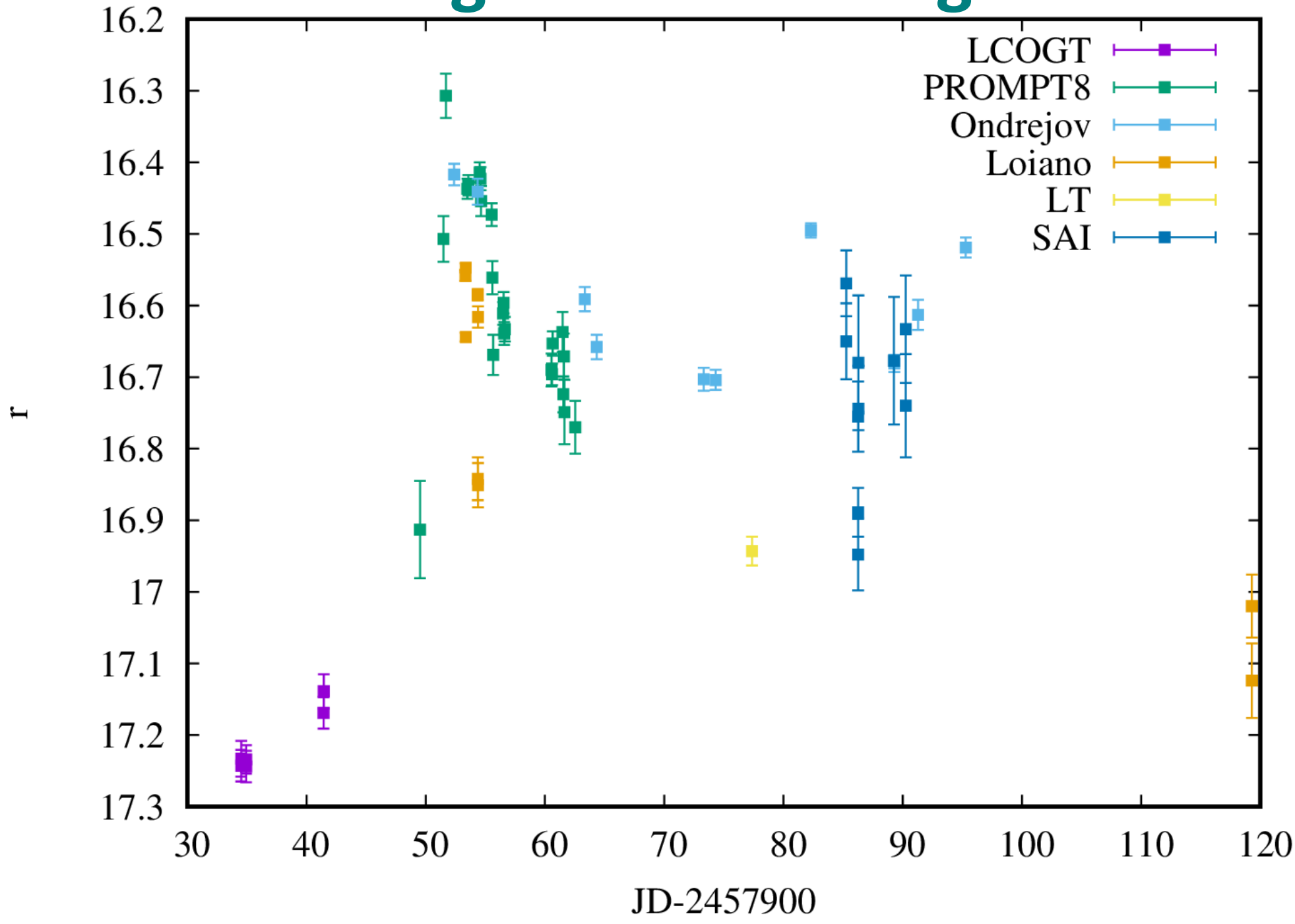
ASASSN-17gs = 2017egv

- Discovered on 2017-05-25 near the center of galaxy 2MASX J15441967-0649156
- Coincides with a **GeV transient** observed by Fermi/LAT (ATel #10482)
- **X-ray transient** by MAXI (ATel #10495) and Swift/XRT
- MDM 2.4m Hiltner telescope on 2017-06-14 measured host **z=0.171** (ATel #10491)
- **No** previous **X-ray** detection
- **Historical radio detection** (NVSS) 47 mJy at 1.4 GHz

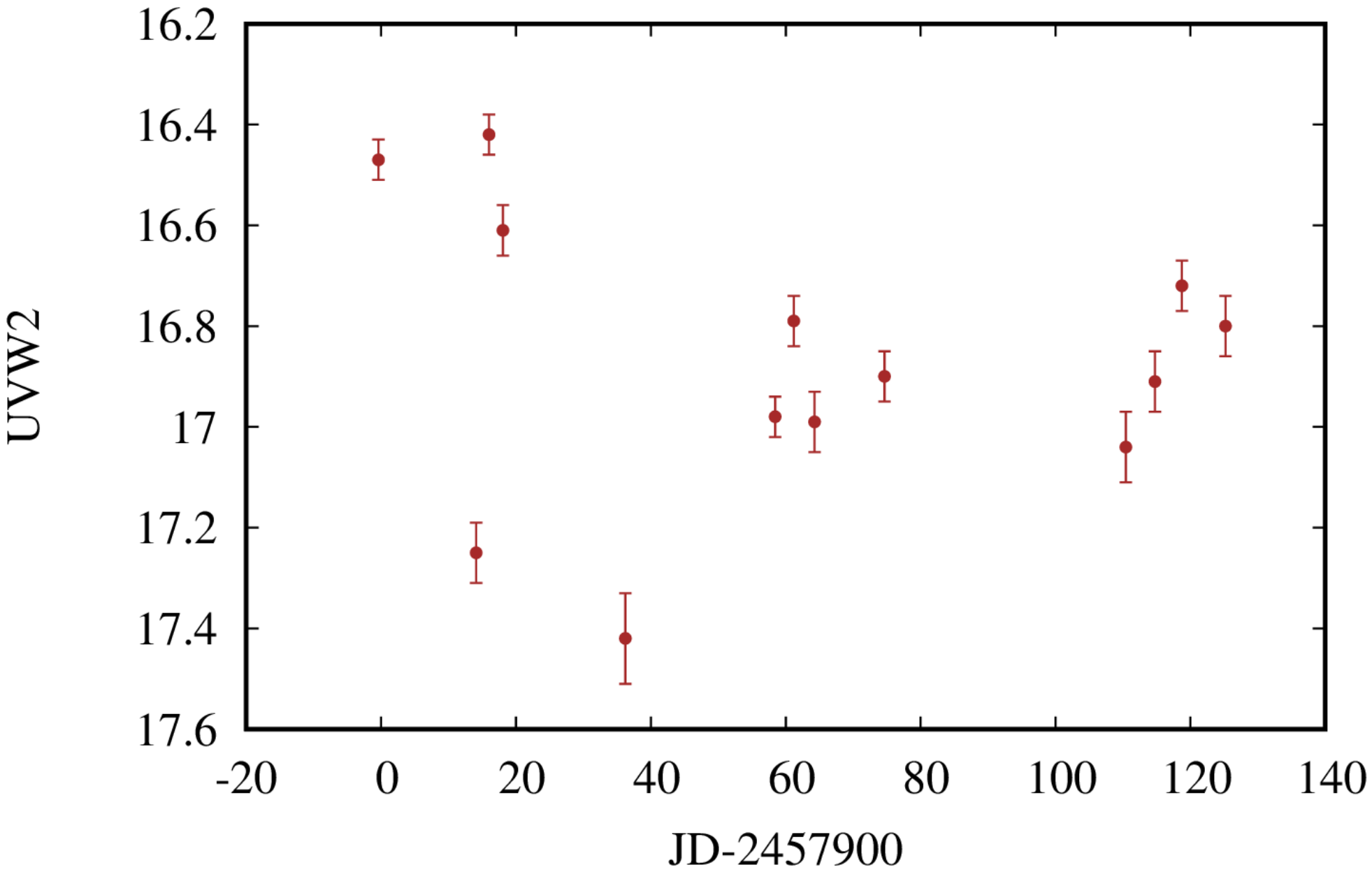
ASASSN-17gs long-term lightcurve



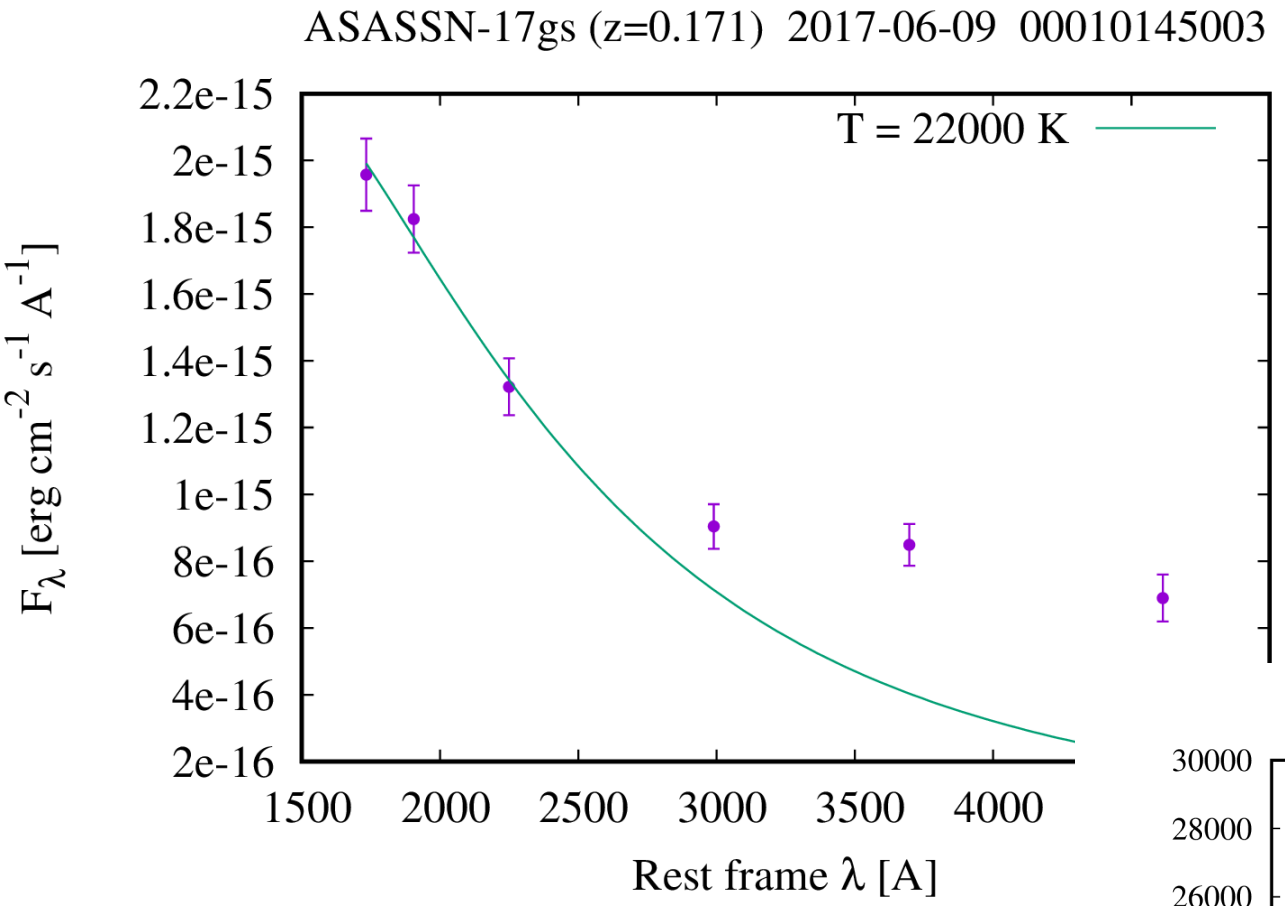
ASASSN-17gs short-term lightcurve

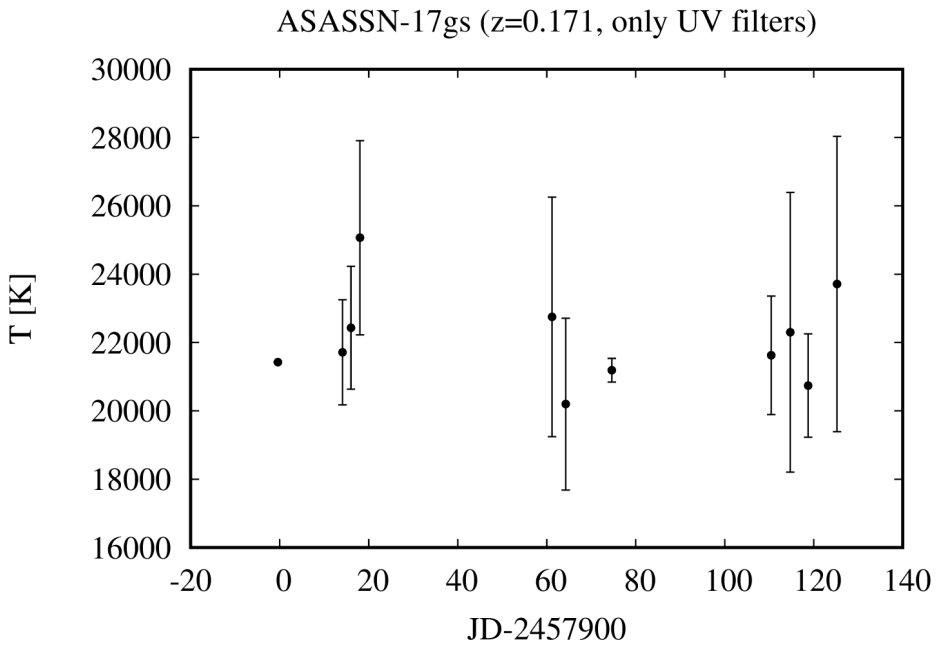


Short-term UV lightcurve from Swift

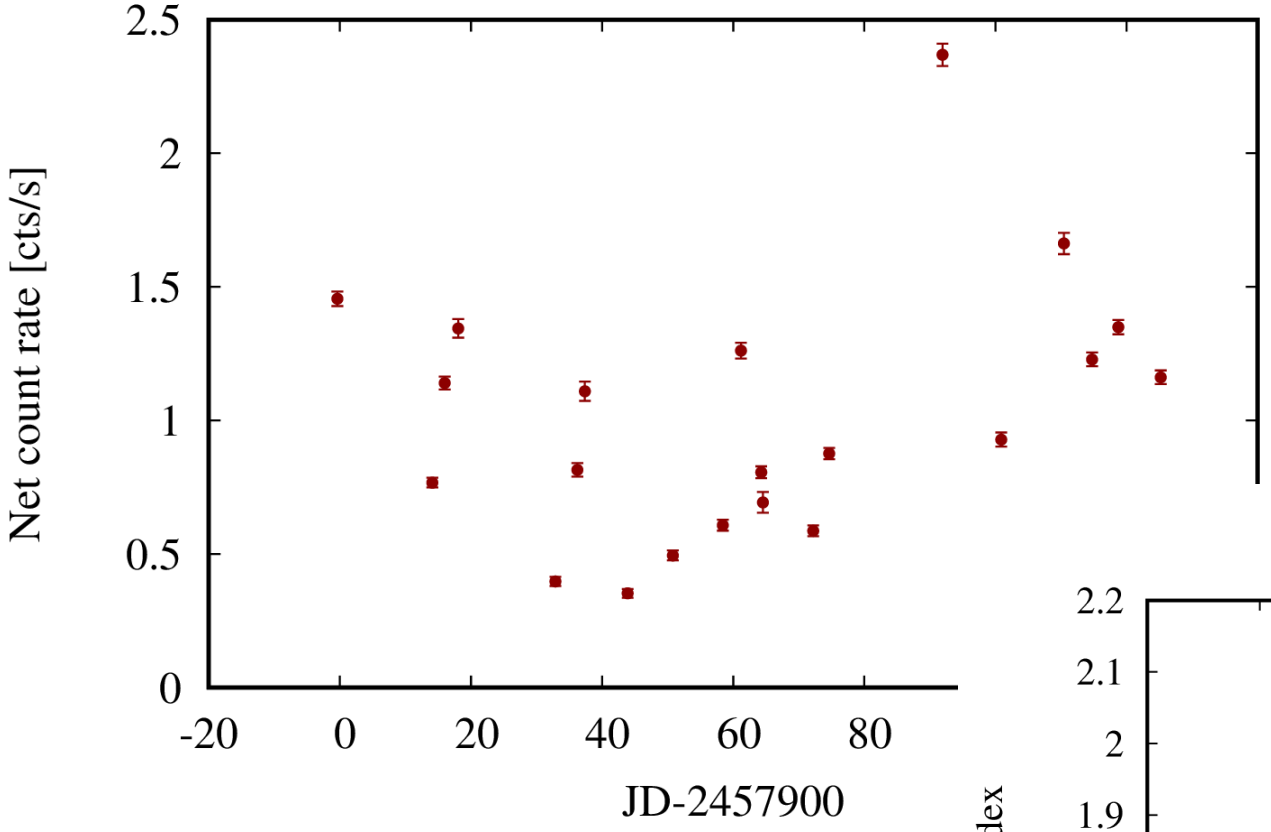


UV color temperature





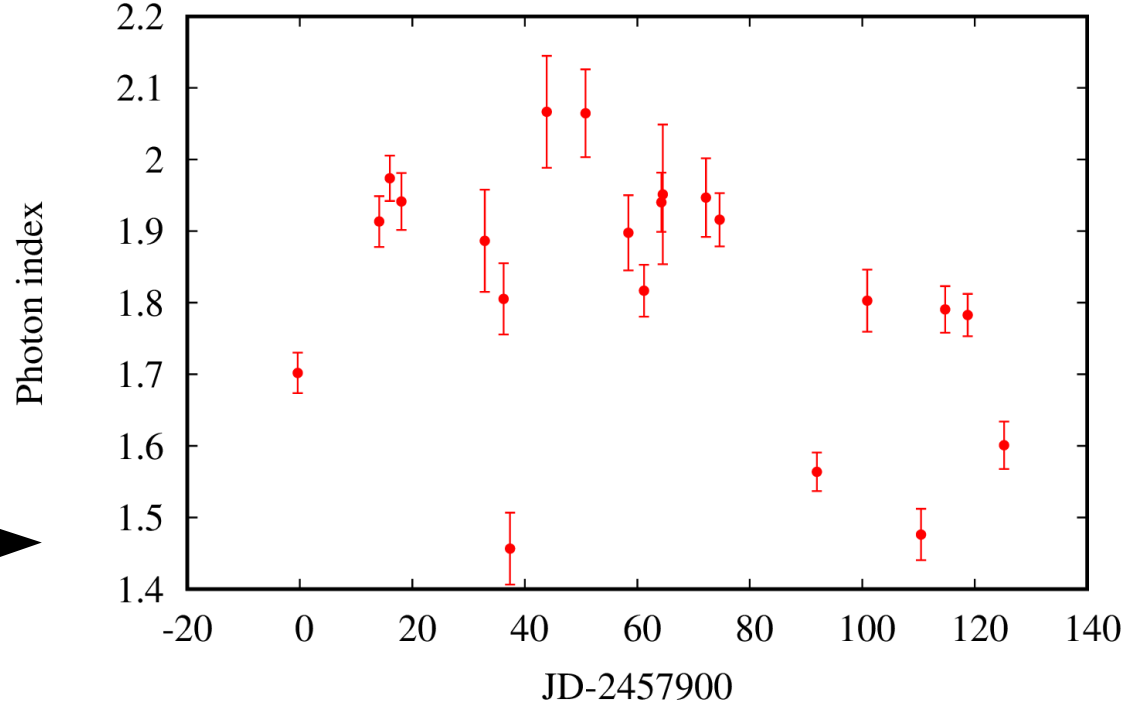
Swift/XRT lightcurve



Irregular variations

in photon **flux**

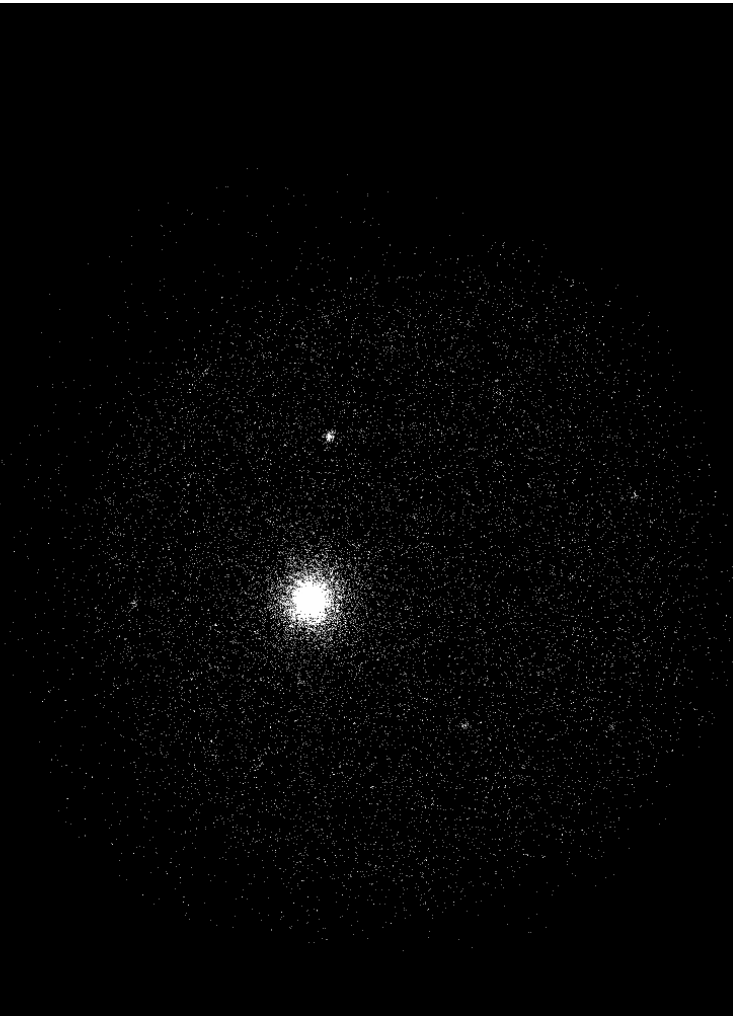
and in photon **index**



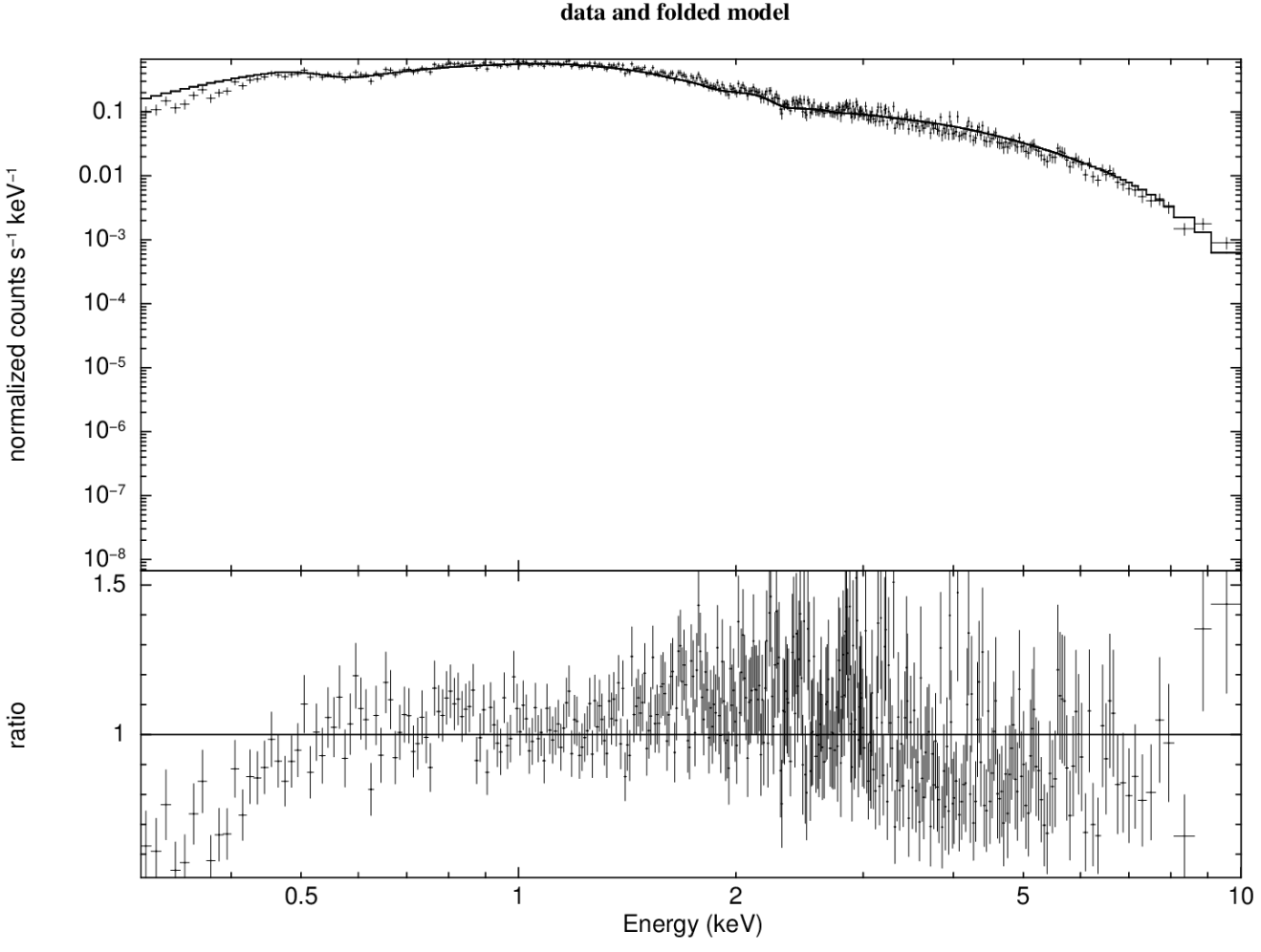
Stacked Swift/XRT data

Exposure: **30ks** between 2017-05-26 and 2017-09-28
Absorbed power law model with **Γ = 1.79** +/-0.01

X-ray image

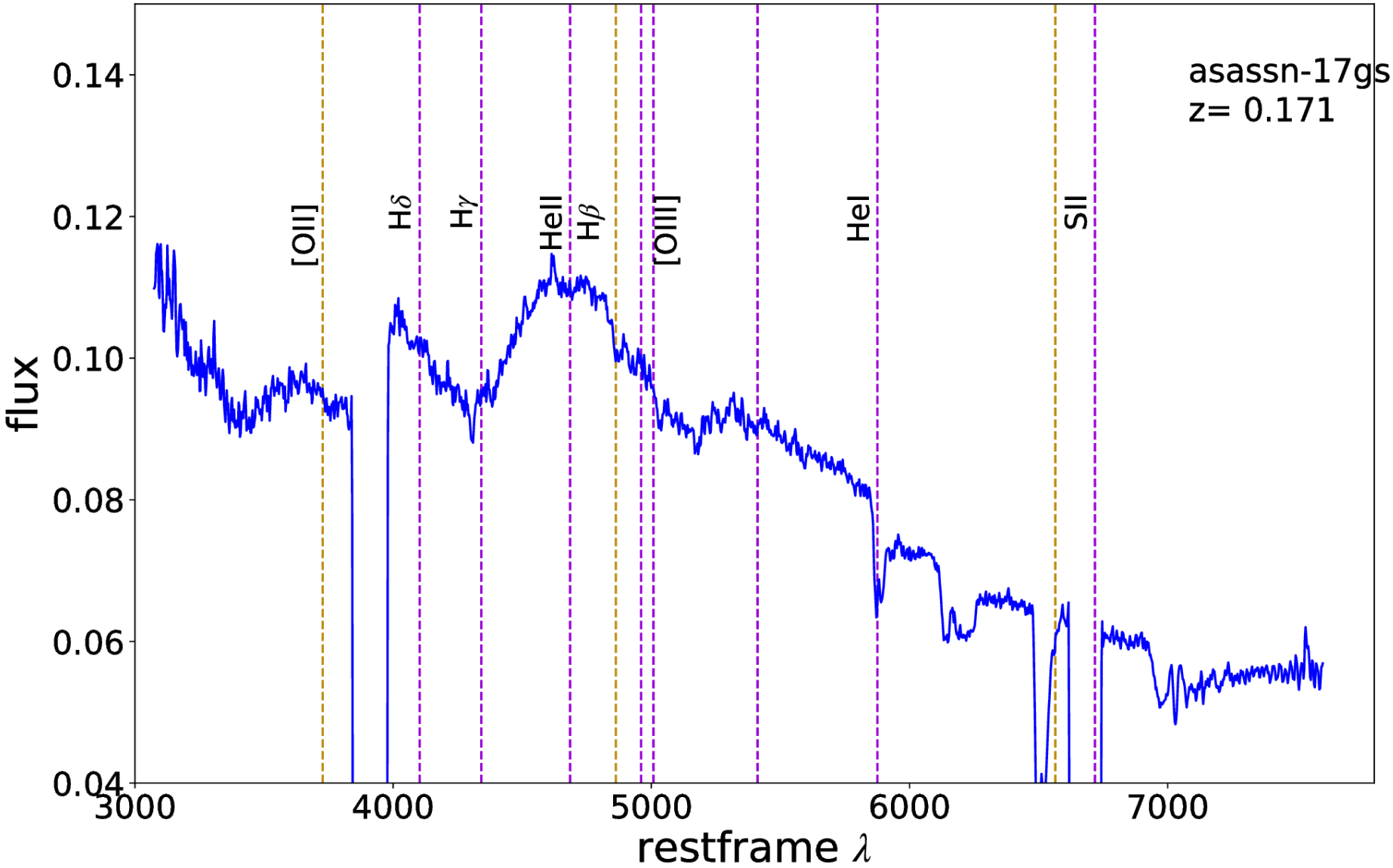


X-ray spectrum



SALT spectroscopy

by Mariusz Gromadzki et al.



Summary

ASASSN-17gs is an enigmatic event

- A transient that is **not decaying**
- GeV/X-ray/optical variability/historical radio detection suggest it's a **previously unknown (inactive?) blazar**
- Optical **spectrum is not typical for a blazar**, but resembles candidate Tidal Disruption Events