

AGN Science with GLAST: Benefits of Long-term Monitoring

Alex Markowitz (Code 662)

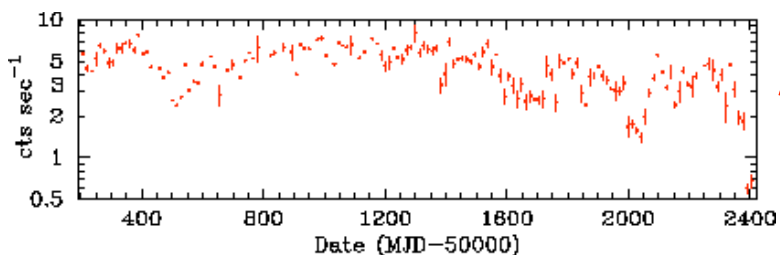
- LAT: All-sky monitor
 - Monitoring for hundreds of blazars
 - Sampling down to 1-3 days for the brightest sources
- Long-term monitoring yields the high-quality light curves (evenly-sampled, uninterrupted, long-duration) which are key for breakthroughs in AGN variability science!**

Example: RXTE monitoring of Seyferts and Blazars

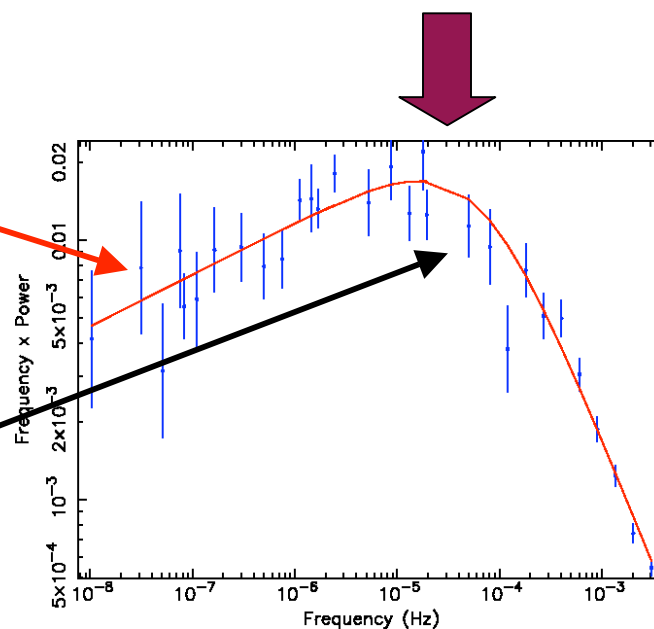
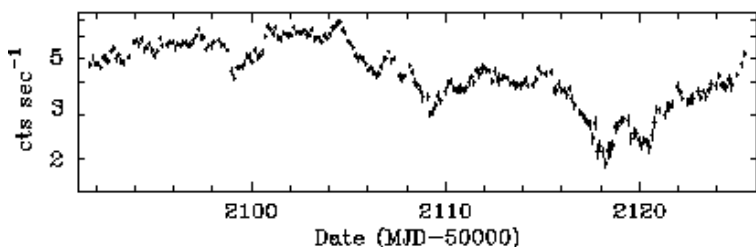
Before RXTE: a few points from different missions, spaced randomly

With RXTE-PCA: X-ray light curves for > 25 Seyferts & Blazars
probing variability properties on hours to 10 years

RXTE: Weeks to years



RXTE: Hours to weeks

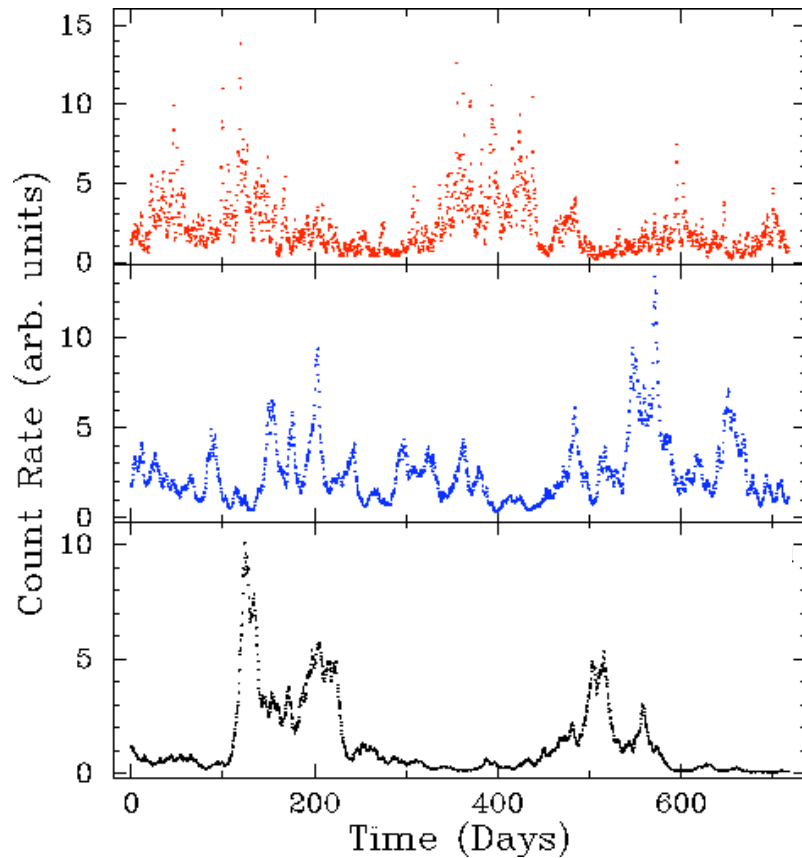


Seyferts: Measure PSDs; Correlations with M_{BH} (Markowitz+ 2003); Parallels to X-ray Binaries; X-ray/optical correlations

Blazars: Preliminary PSDs time scales: similar to Seyferts

Long-term Monitoring With GLAST:

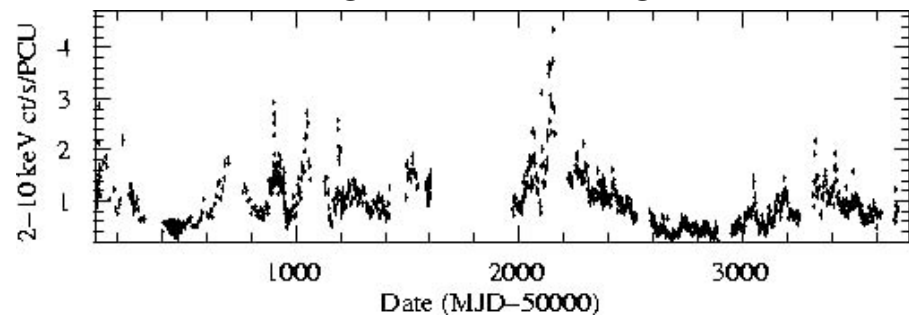
Simulated LAT light curves



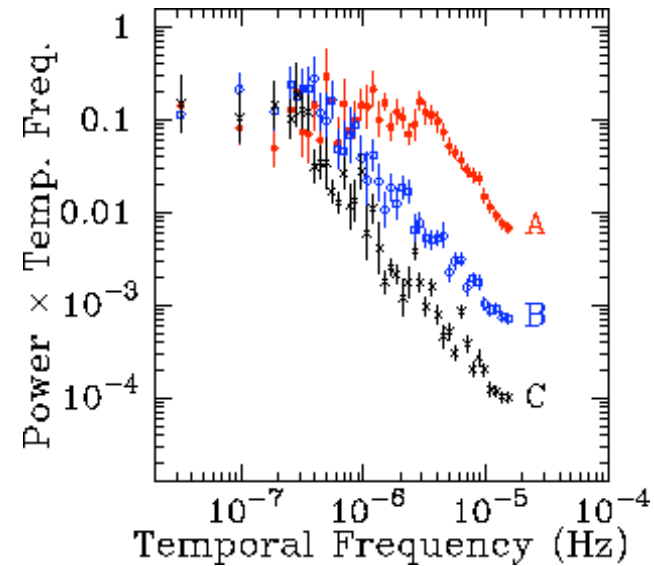
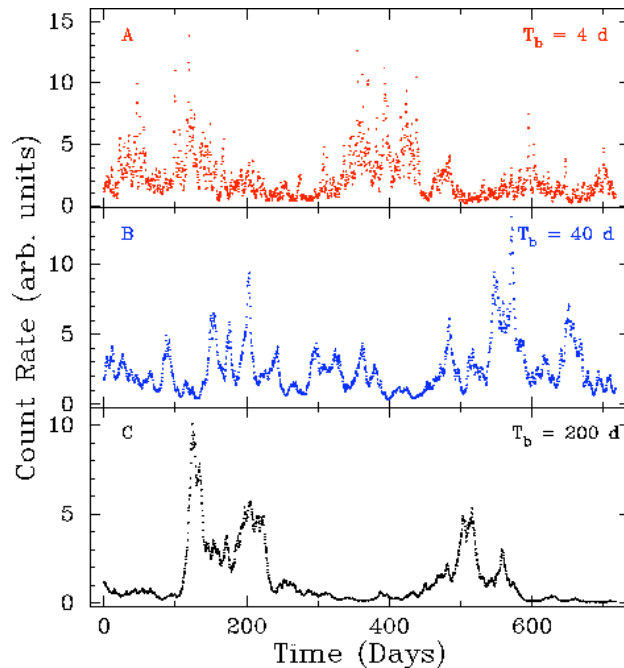
What can GLAST do?

- 1) Identify Blazar flares; Trigger multi- λ campaigns; constrain SED & interband time lags
- 2) Long-term interband correlations: Study slowly-evolving flares over weeks-months

3C279: RXTE-PCA



What can GLAST do?



3) Within 1-2 years of launch: Measure broadband γ -ray PSDs for first time: Identify characteristic time scales

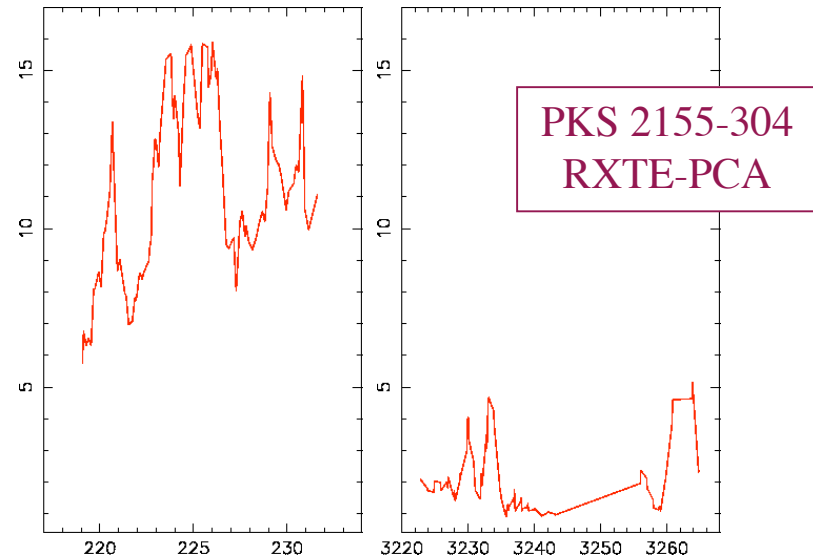
4) Typical number of outbursts per year; typical minimum/maximum γ -ray fluxes -- gauge each blazar's "personality"

Correlations with M_{BH} , Lumin, or z ?

What can GLAST do?

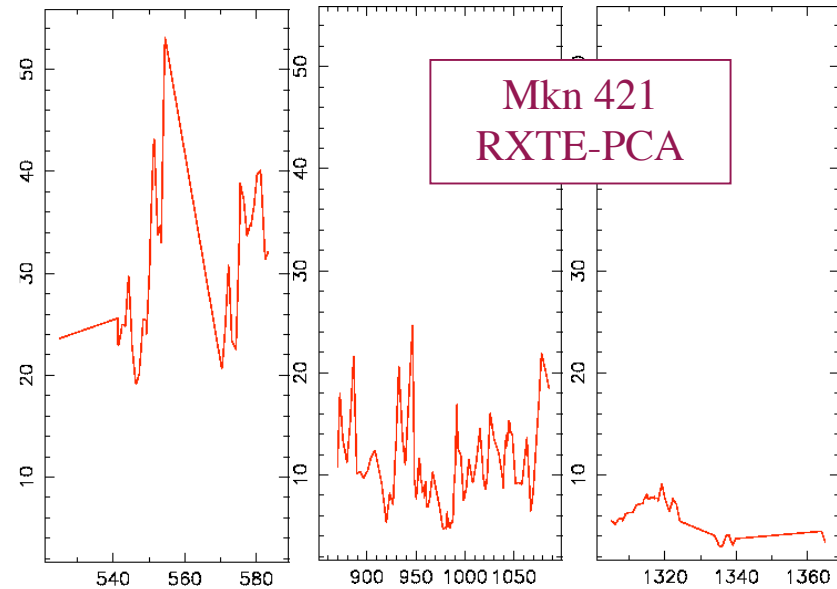
5) Study variability over multiple timescales and at all flux levels (including quiescence):

- X-ray RMS-flux relation in PKS2155 (Zhang+ 04); in Seyferts & XRBs (Uttley+McHardy 01). *Do γ -rays behave the same way?*



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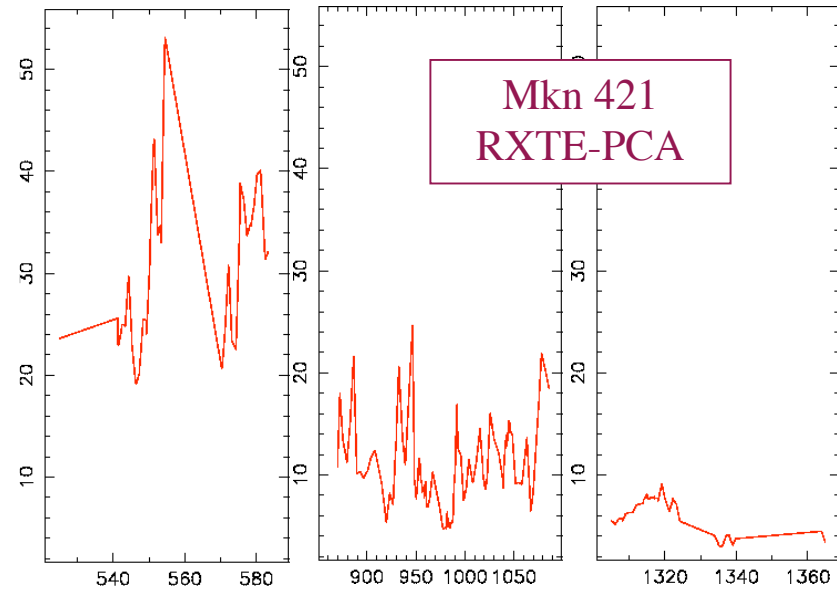
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- One continuous variability process at all fluxes? Or discrete flaring events superimposed on non-varying 'quiescent' flux level?
- Disk-jet connections: Example: Could variability mechanism originate in disk, not jet, with jet passively re-processing disk emission?
- "BH grand unification" in terms of variability properties across all accreting BH systems: Blazars/Seyferts/X-ray Binaries

