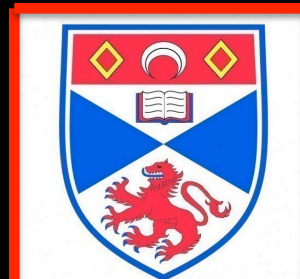


Wiggles & dots: resolving unresolvable accretion discs in AGN

David Starkey, Keith Horne

Tuesday 10th January 2017

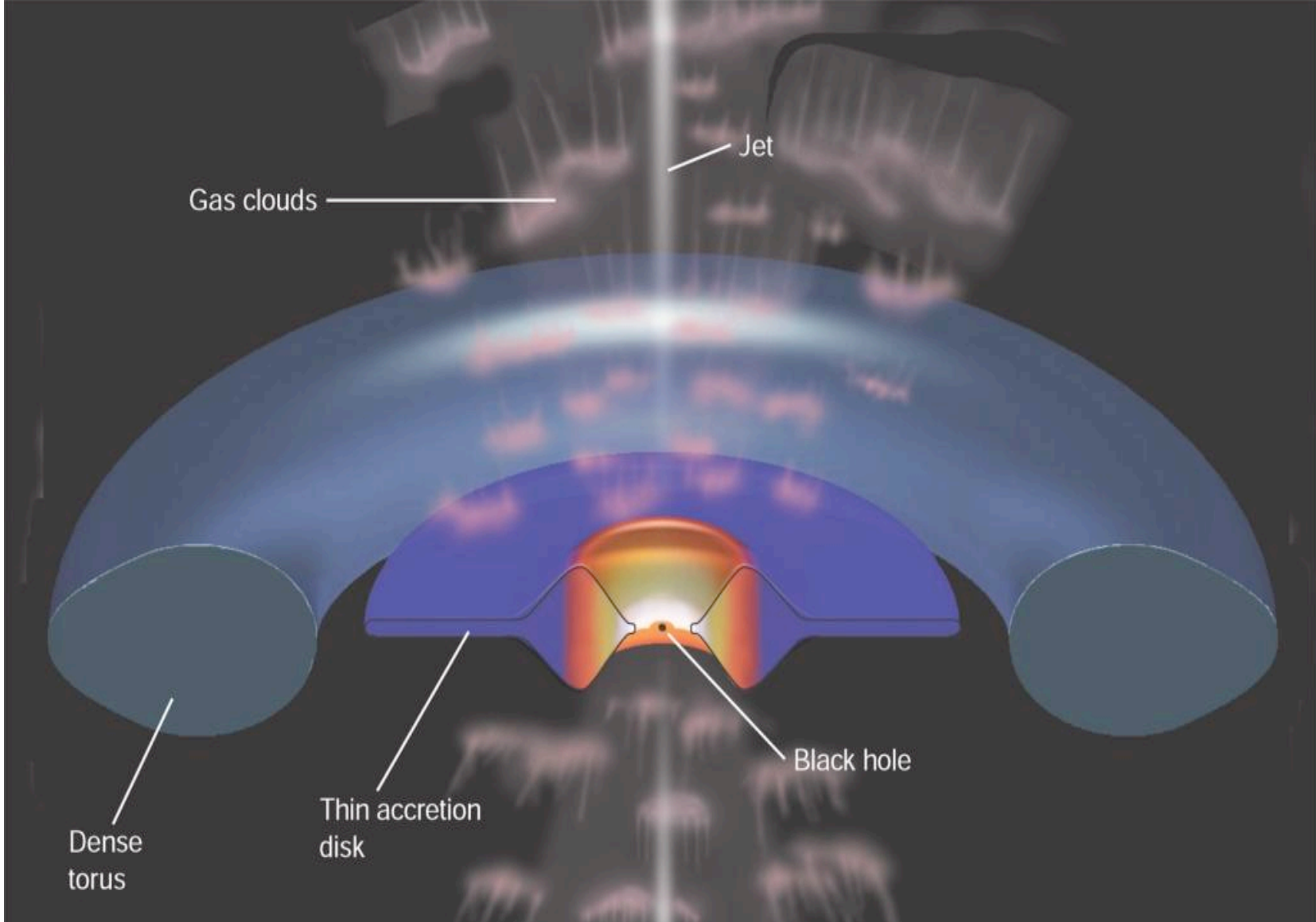
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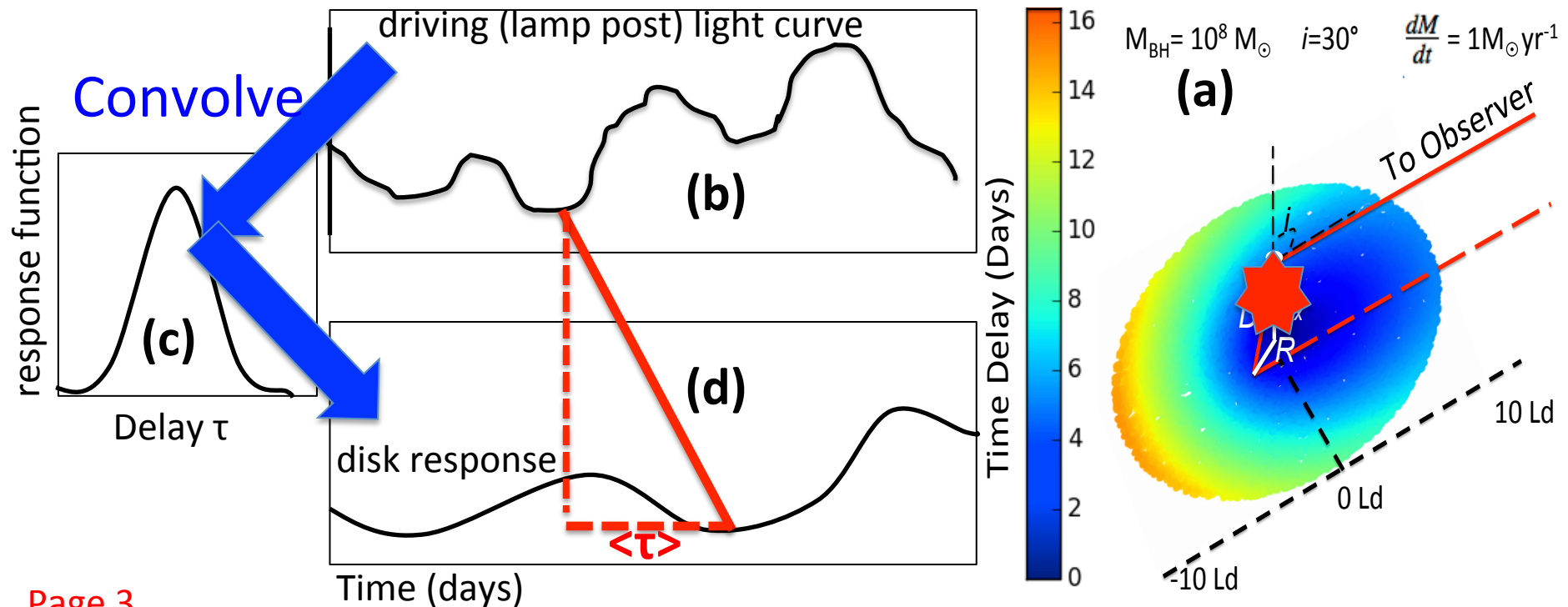
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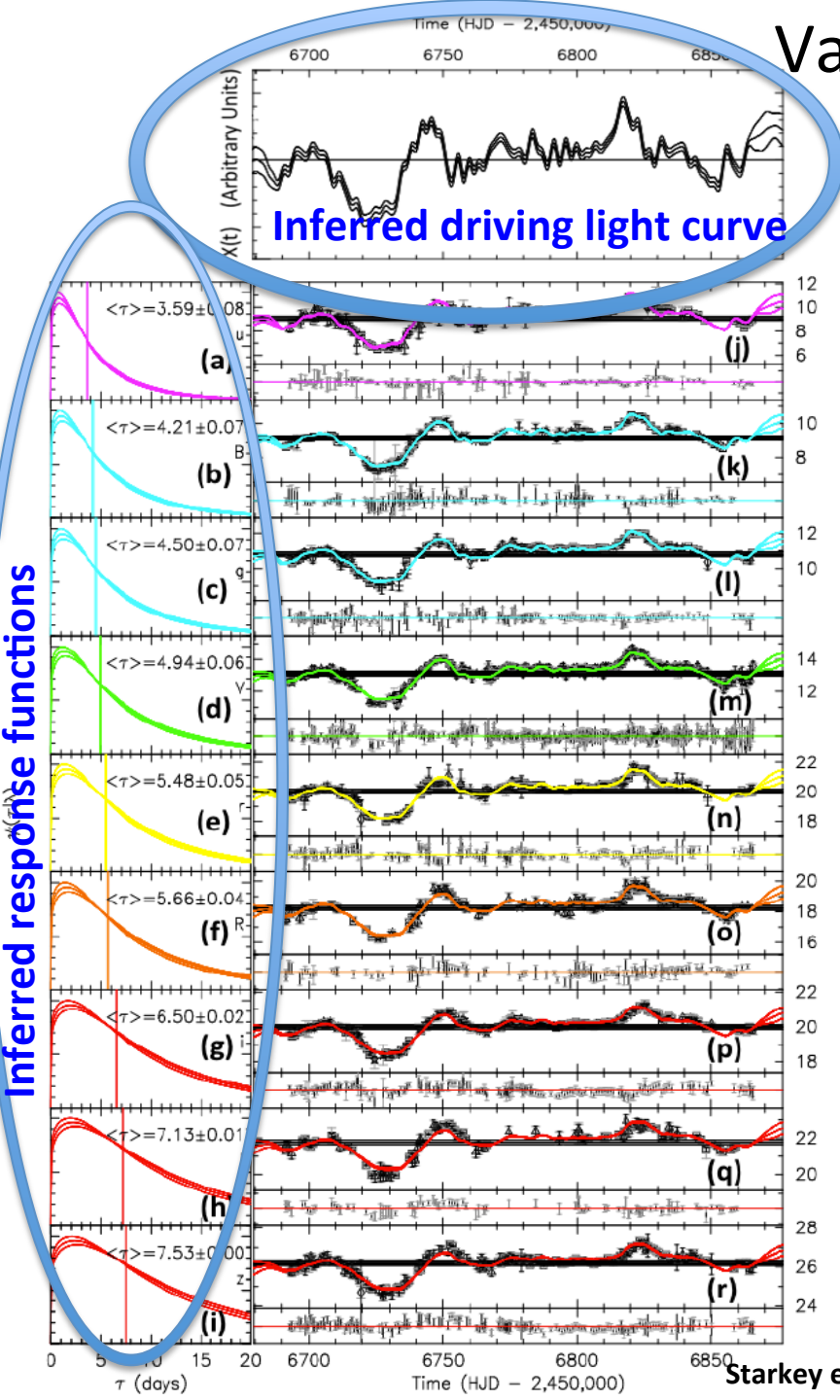
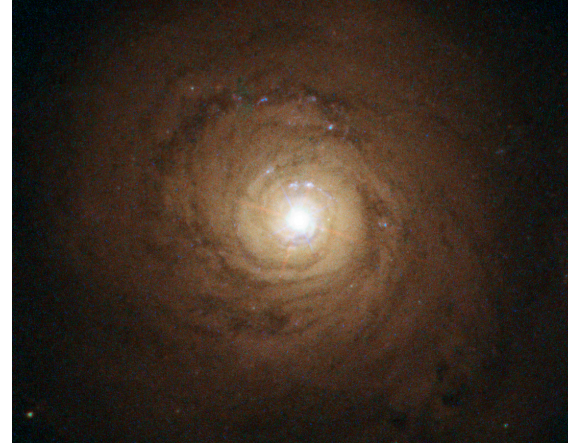
- Accretion disc occupies scales \sim light day. How to study AGN behavior and accretion properties on such small scales?

Accretion Disk Time Delays

- A simple way to model the variable accretion disk emission is with a lamp post.
- Accretion-powered disk variability originates in a lamp post (see  in Figure a).
- Light-travel-time effects mean that shorter wavelength light curves (emitted from inner, hotter disc surfaces) lead longer wavelength light curves.



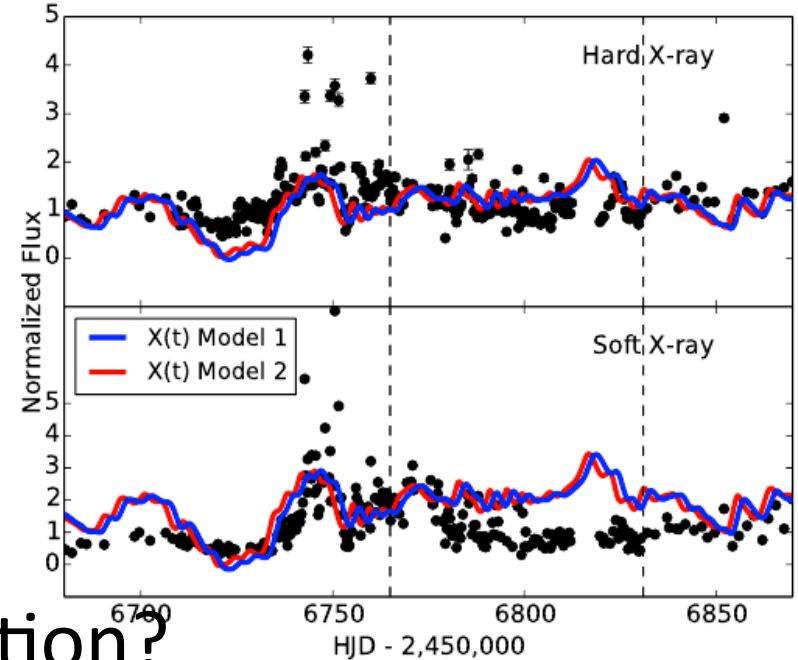
Variability studies using MCMC



- 170 day observing campaign January – July 2014 (NGC 5548).
- Overlapping swift, HST, ground-based light curves in 19 bands ($\sim 1000 - 10000\text{\AA}$).
- The Markov Chain Monte Carlo fits (Starkey et al 15 & 16) **infer the driving light curve** (top panel) **and response functions** (Panel a-i) **from the light curve data.**

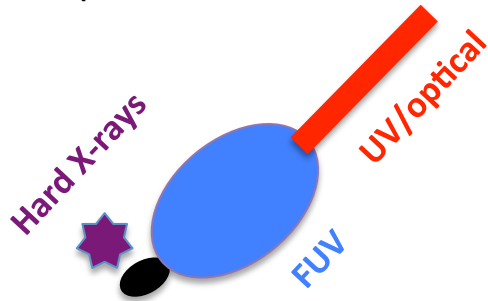
Conclusions & Future Work

- X rays alone do not appear to drive disc variability in NGC 5548.
- Larger time lags & steeper Temperature slope than expect for a standard accretion disk with $\alpha = 3/4$.



Interpretation?

Double reprocessing region
(Gardner & Done 2016)



Tilted inner disc (Starkey et al in prep)

