

Early jet-cocoon emission in future GW170817-like events

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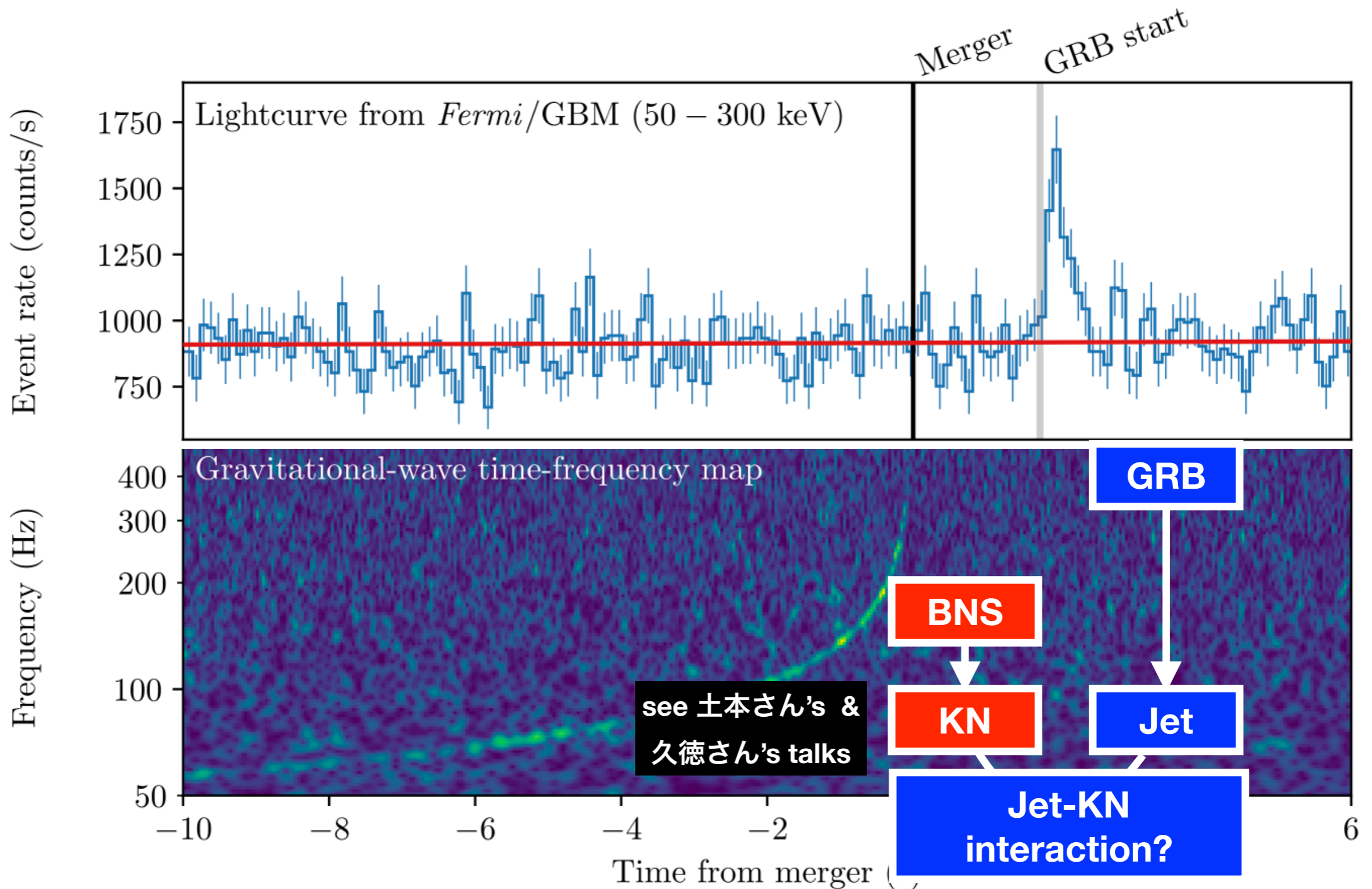
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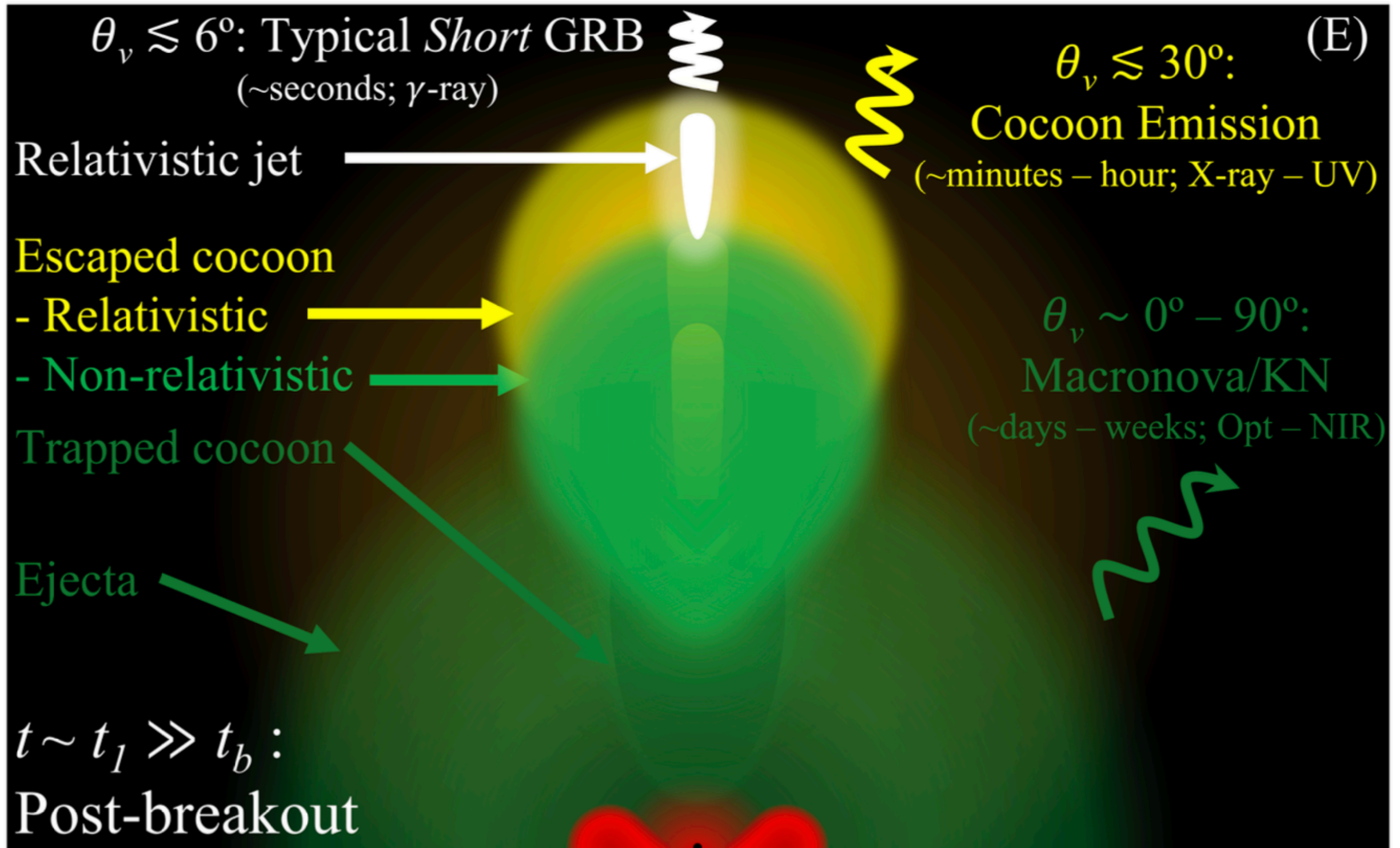
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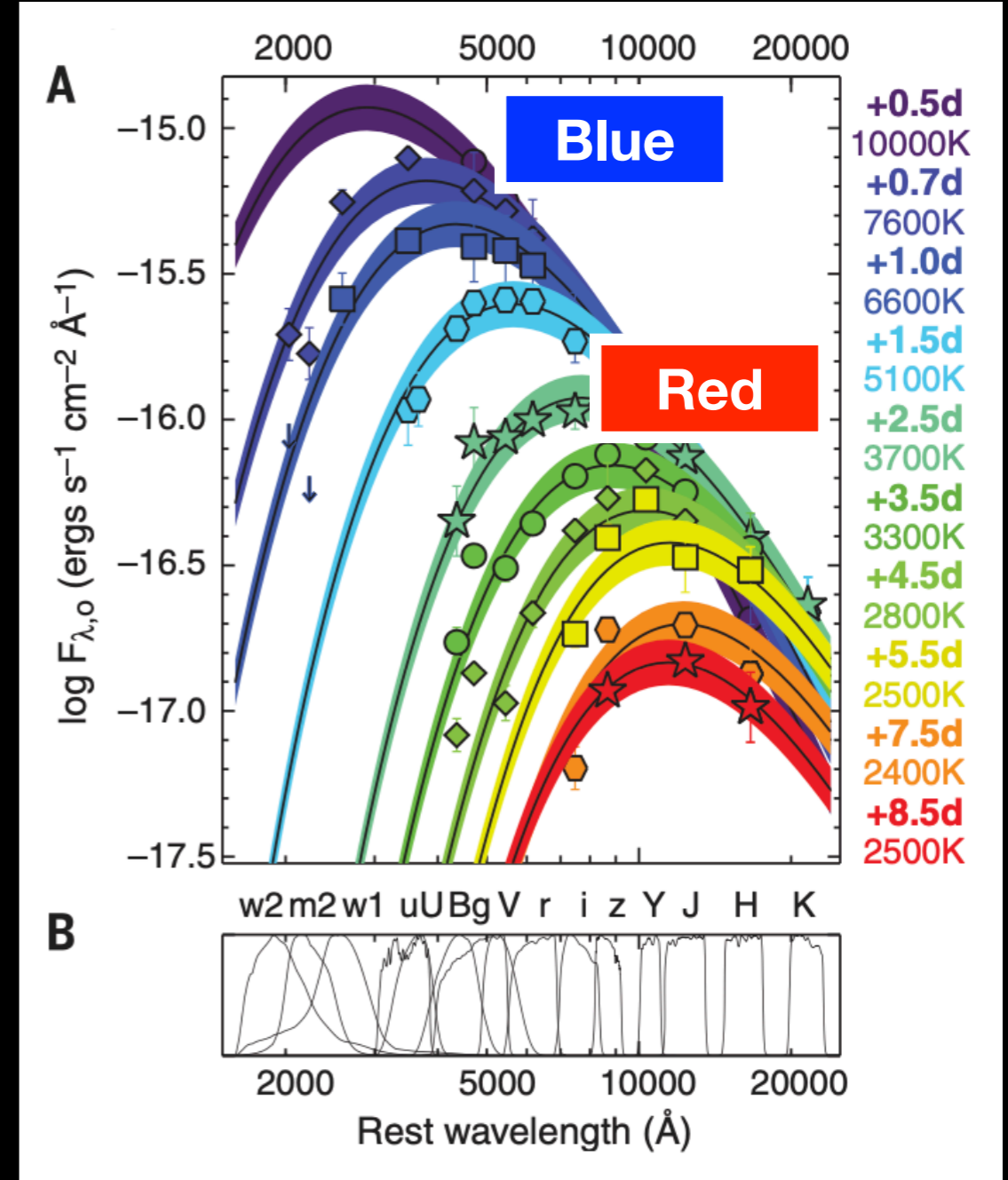
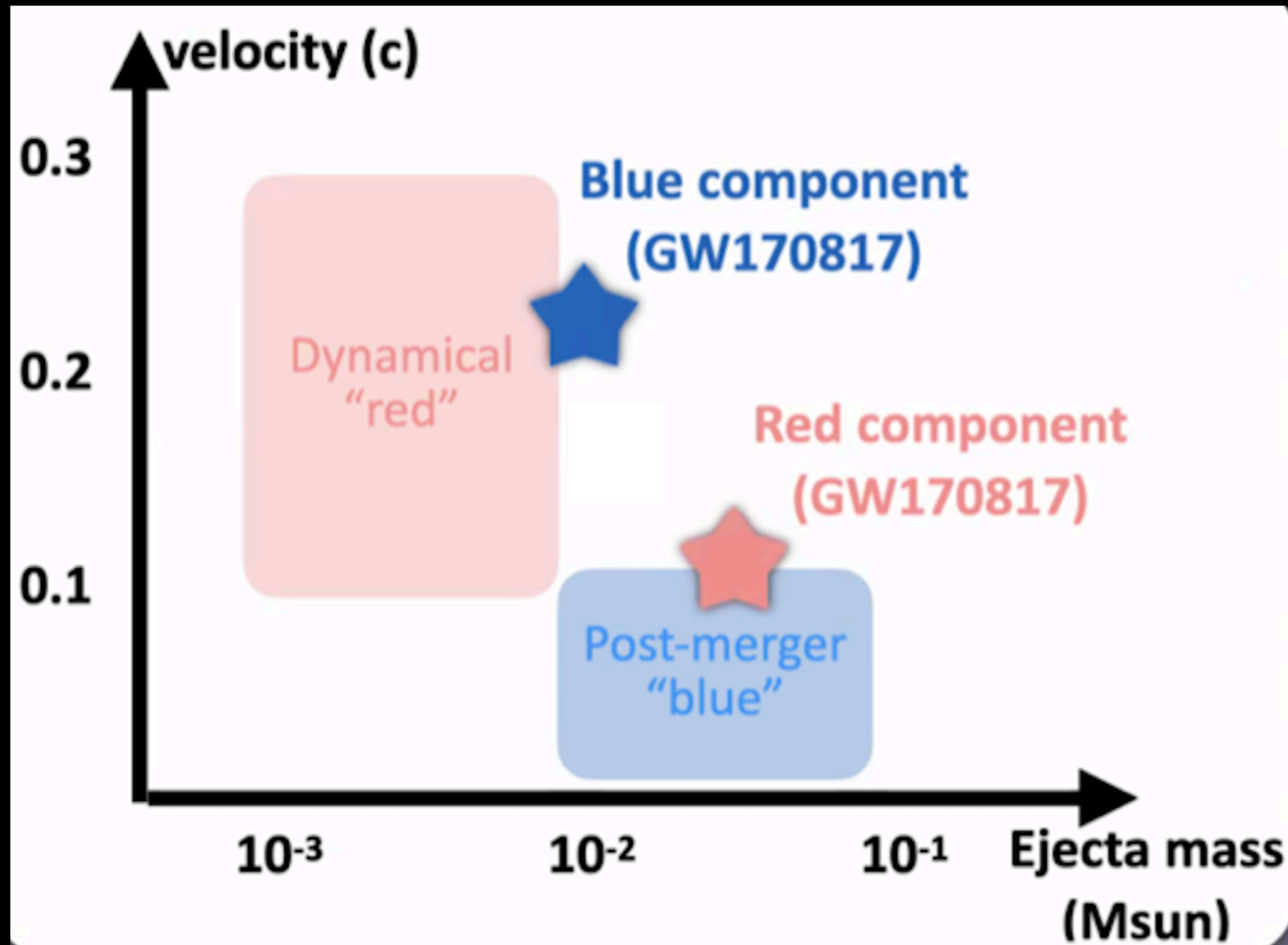
GW170817



Jet-ejecta interaction: “Cocoon”

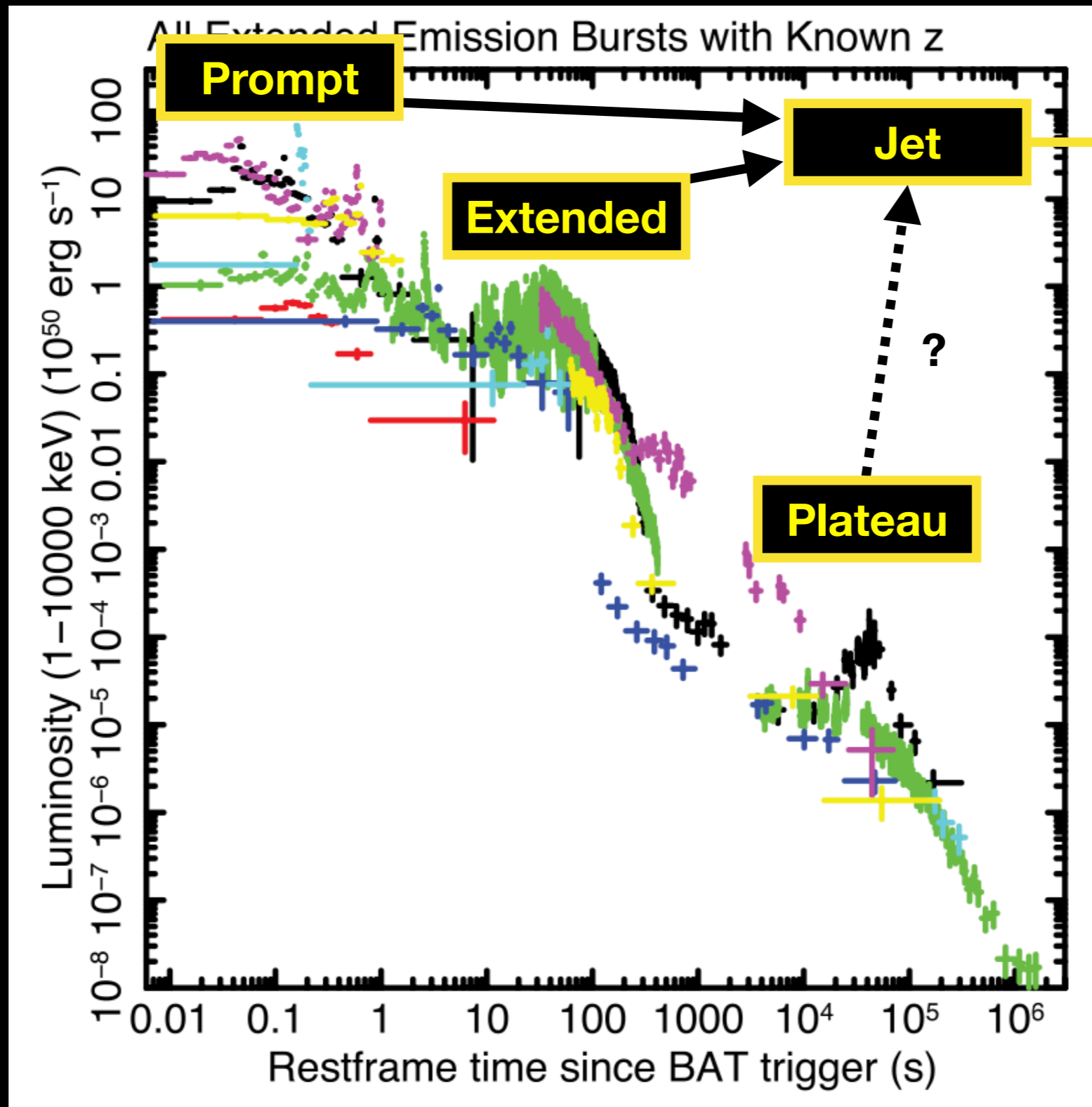


Blue KN [origin?]



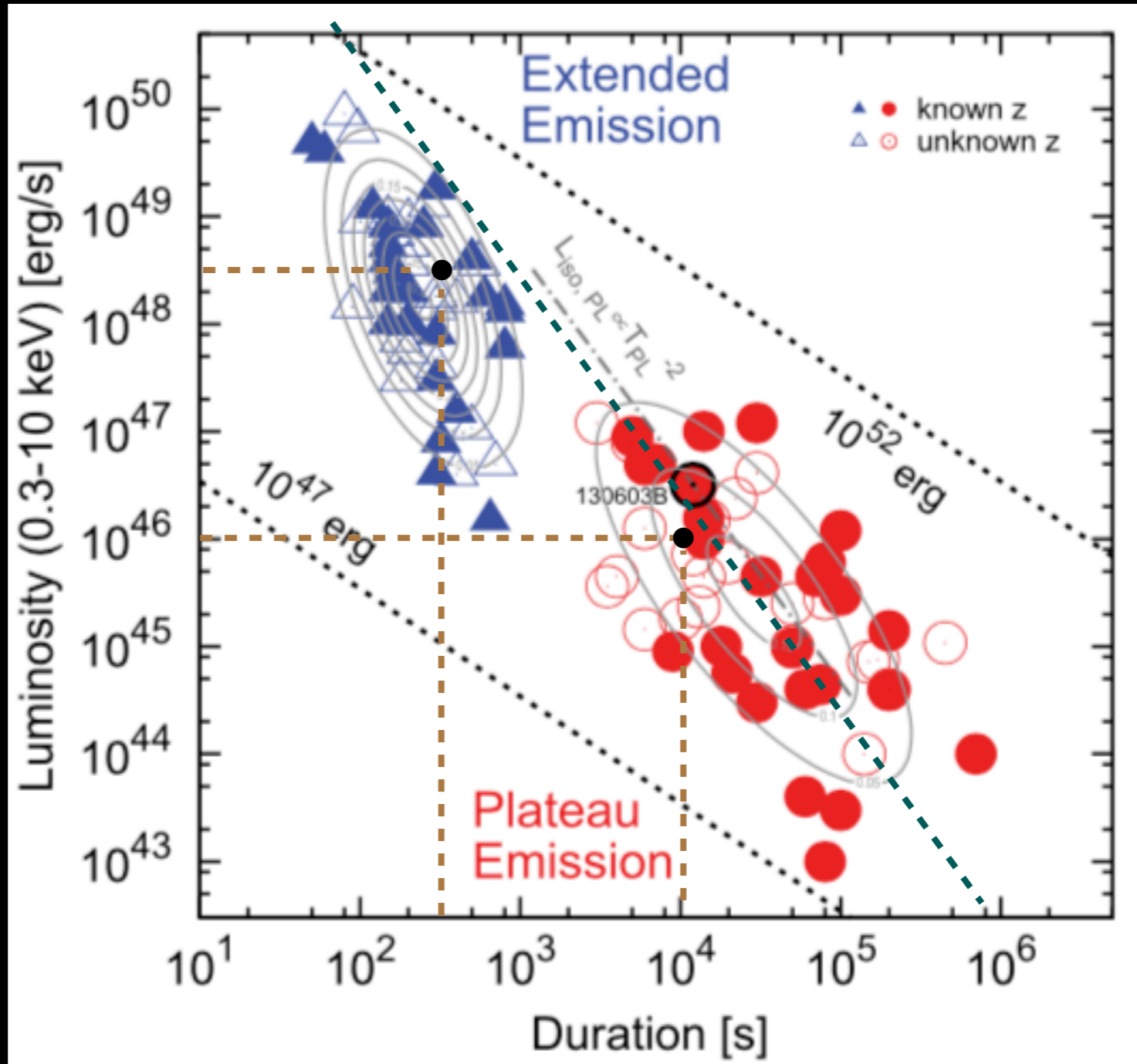
Credit: Tanaka Masaomi; Drout et al. (2017)

Late engine activity

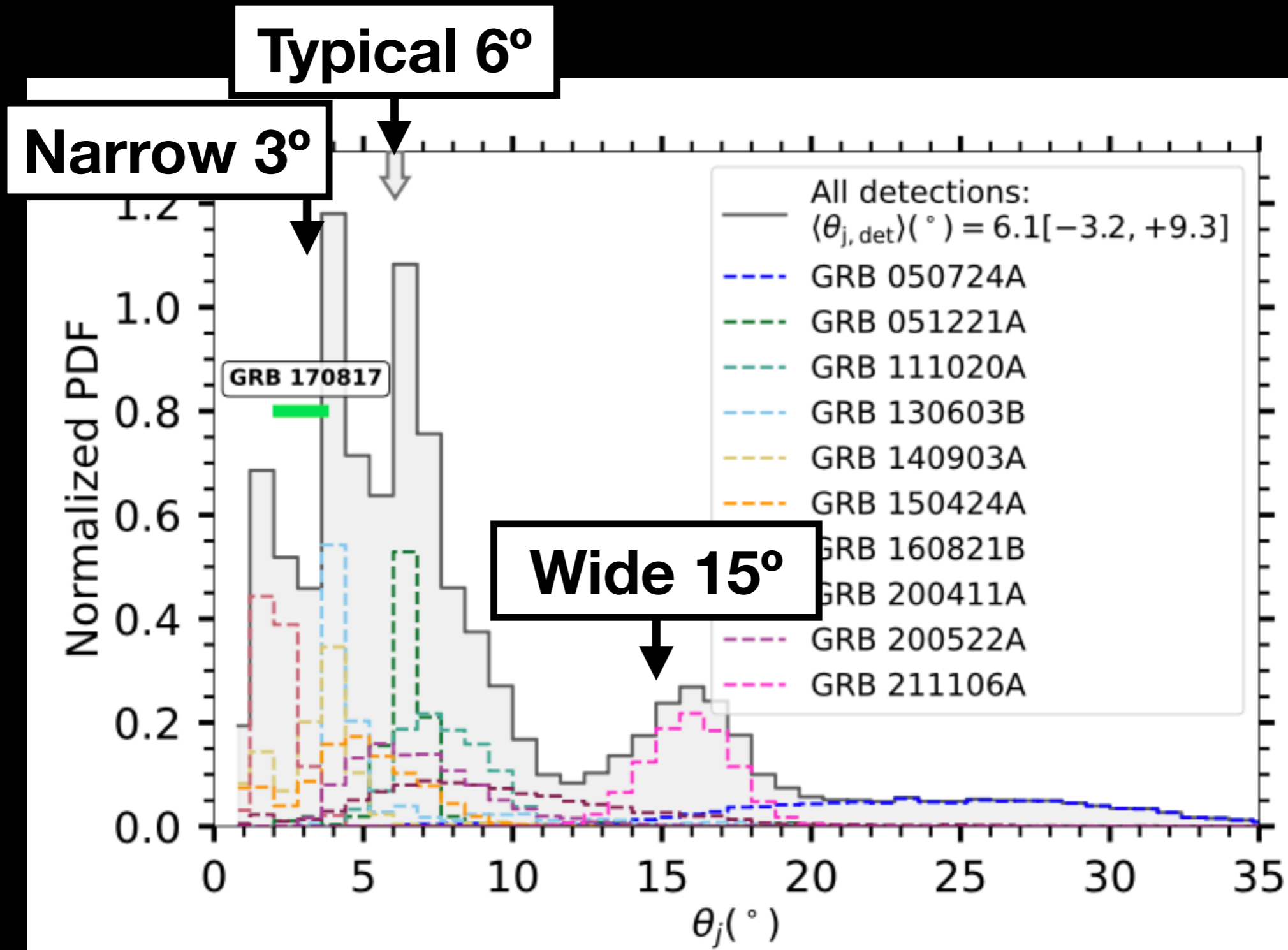


Jet-ejecta interaction?

Typical L & t [$\eta_\gamma \sim 10\%$]



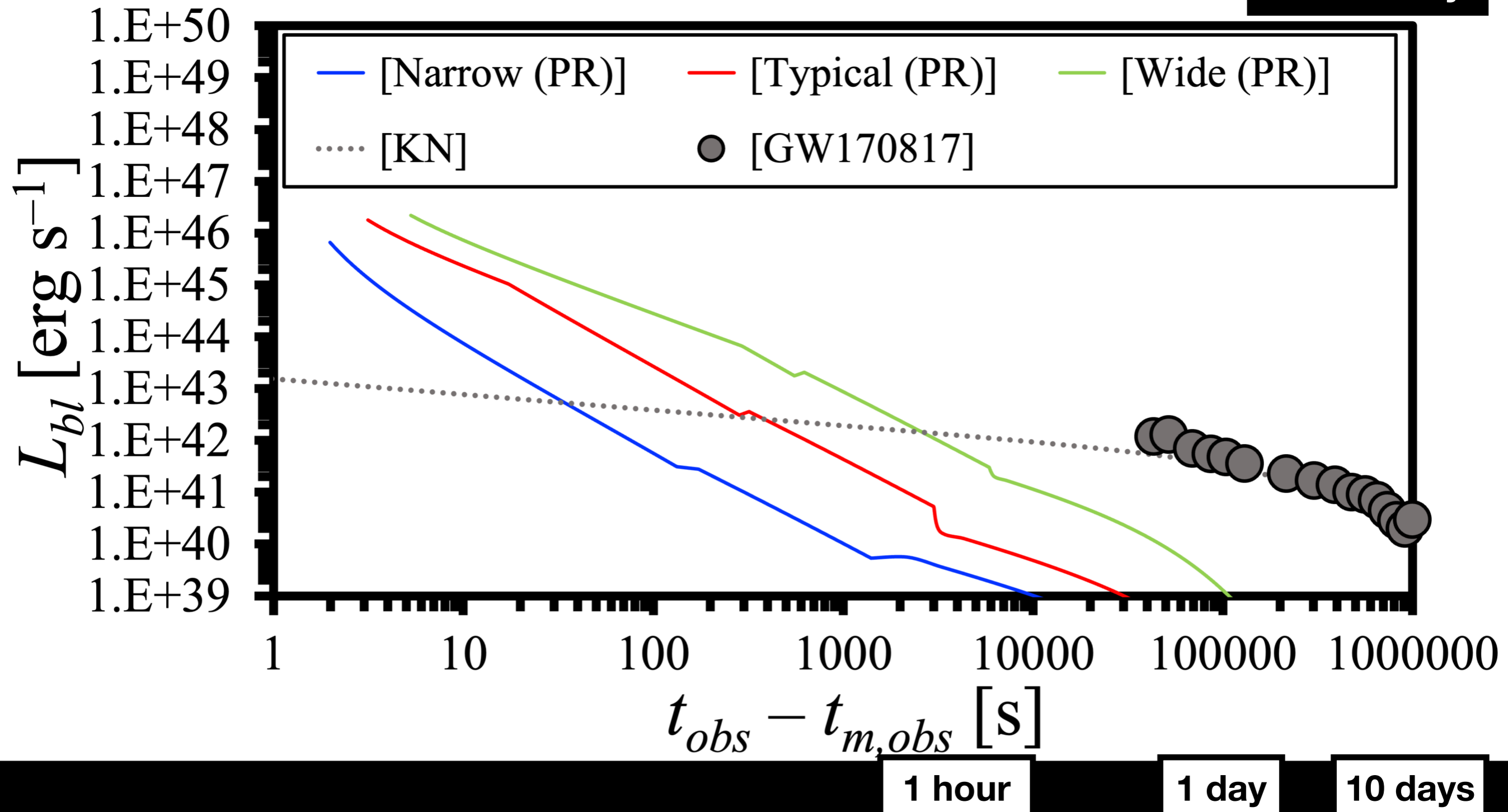
Three jet models



Results

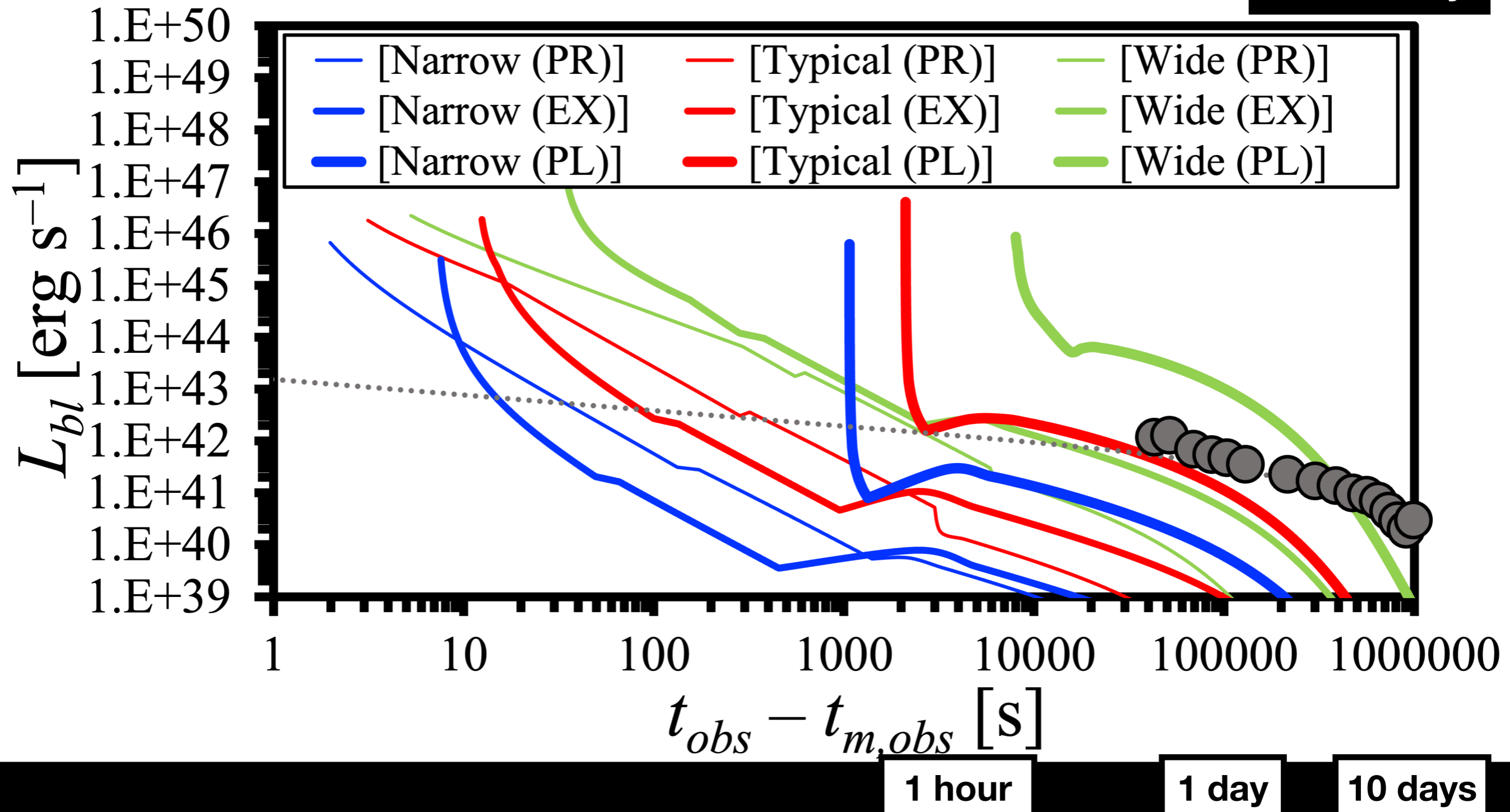
Cocoon [prompt emission]

Preliminary



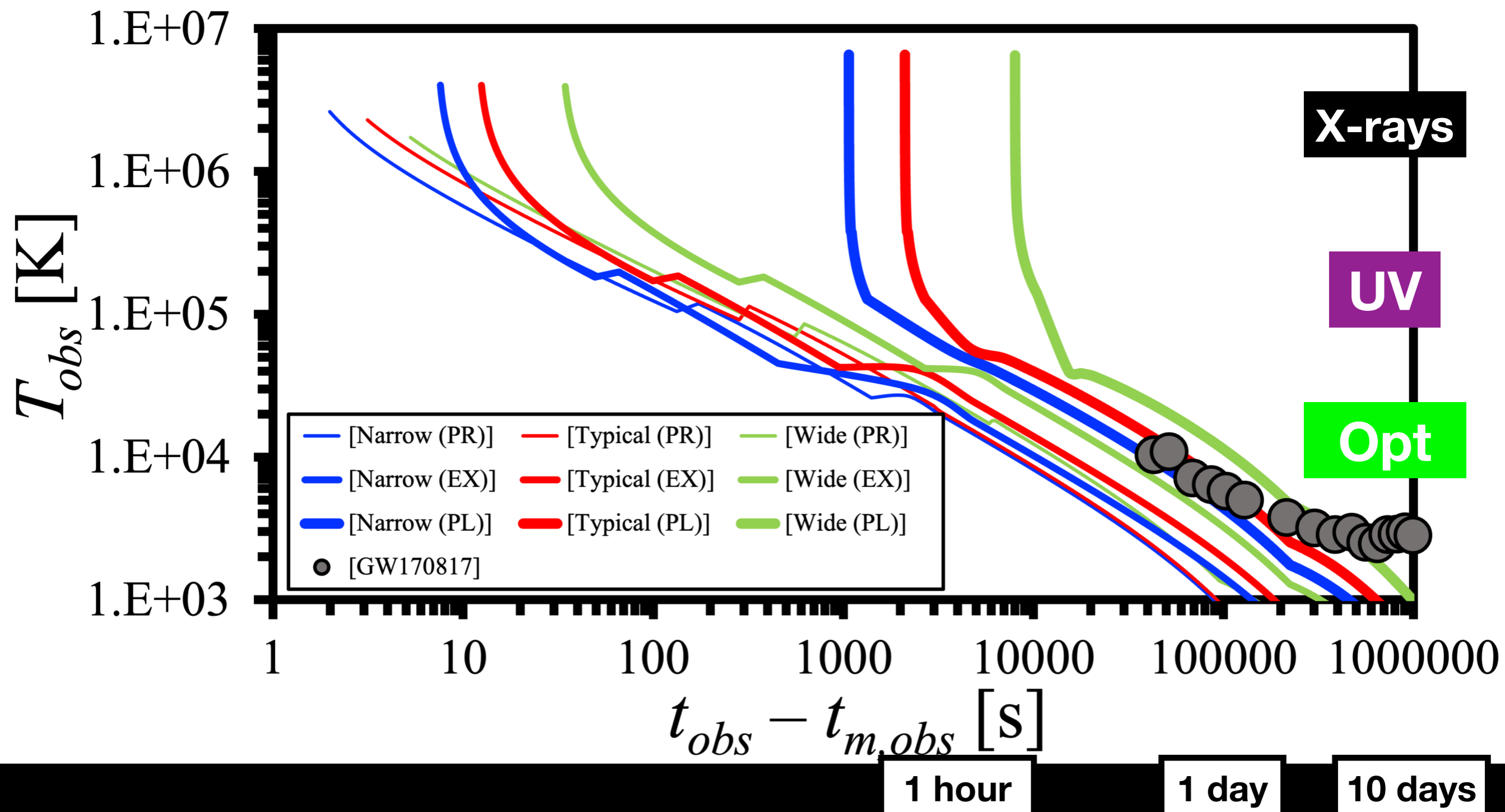
Cocoon [extended and plateau]

Preliminary



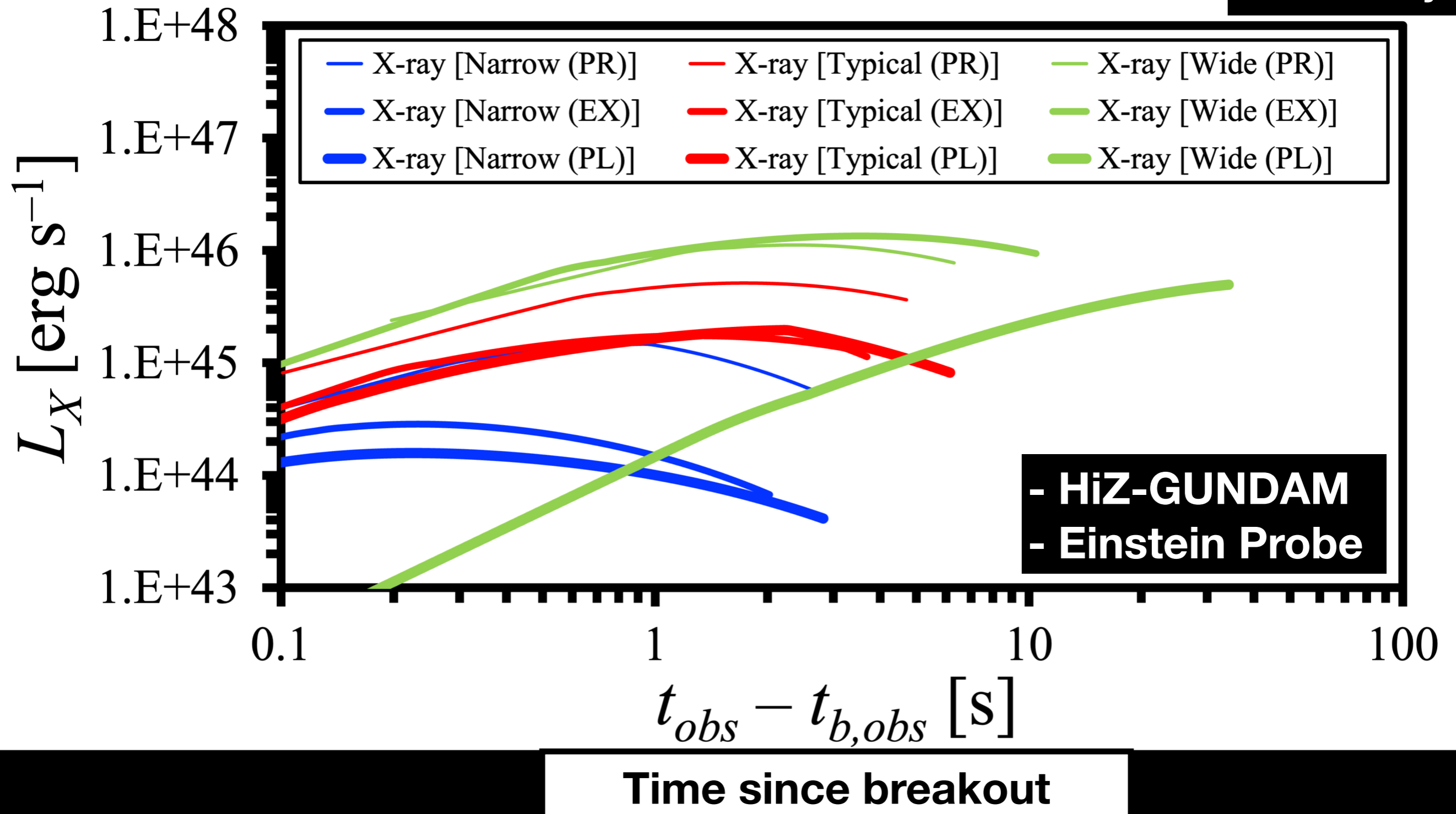
$$h\nu_{\text{peak}} \approx 2.4 \text{ keV} \left(T_{\text{obs}} / 10^7 \text{ K} \right)$$

Preliminary



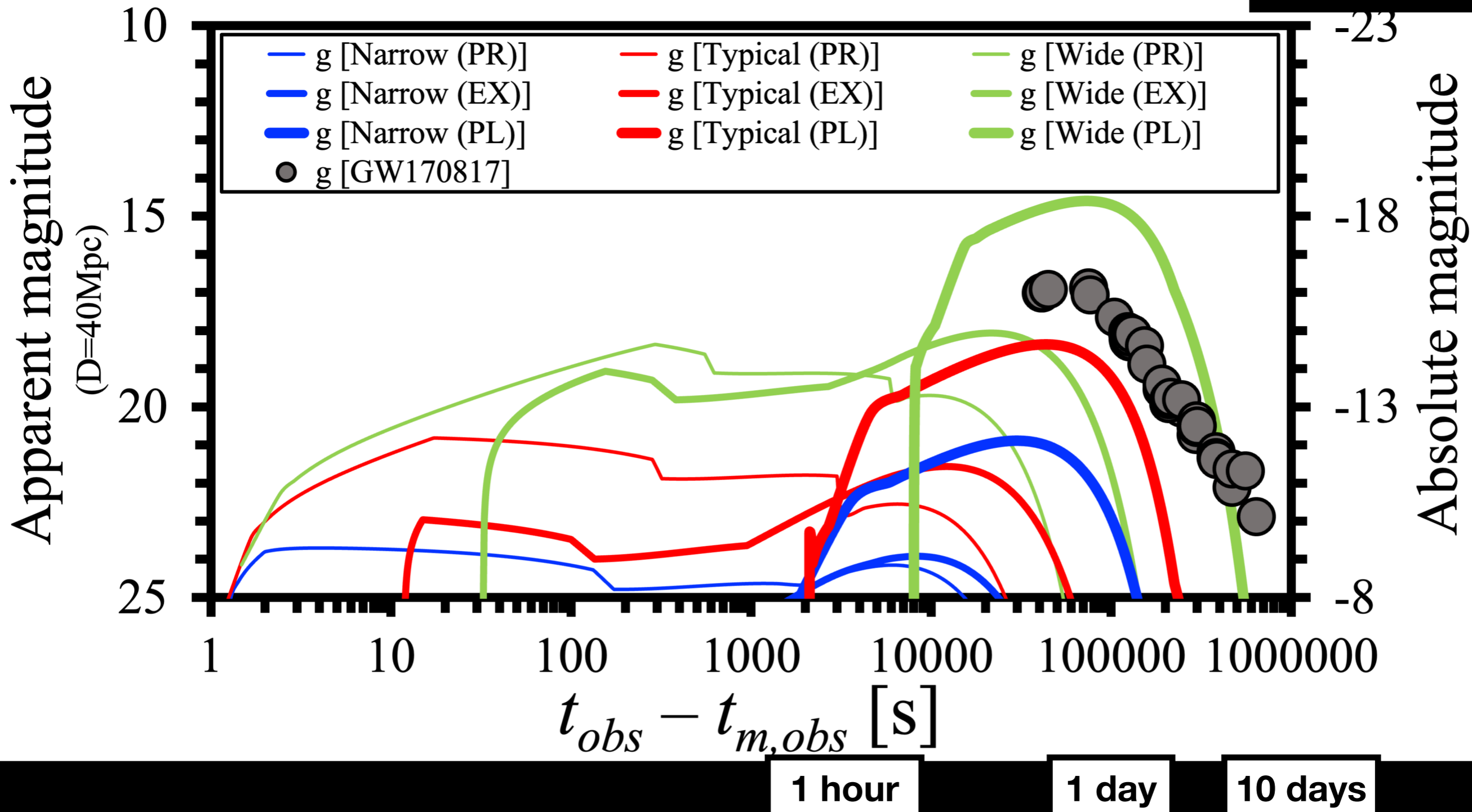
X-Ray [$h\nu_{\text{peak}} \sim 0.1 - 0.5 \text{ keV}$]

Preliminary



Magnitudes [Opt]

Preliminary



Summary

Early KN as a bright multi-messenger source

in X-ray/UV/Opt, in addition to GWs, γ -rays... Can help understand sGRB engines

Wide jets' cocoon could explain the blue KN

bright due to the large breakout radius. Although there are other alternative explanations (e.g., Kawaguchi et al. 2018)

Bright soft X-ray emission $\sim 10^{45} - 10^{46} \text{ erg s}^{-1}$

detectable with HiZ-GUNDAM (~ 2030) and Einstein probe (2023-2024)