

NIR Spectroscopy of Early Afterglow of Ultra-Long GRB 111209A



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GRB

(Gamma Ray Burst)

Long

GRB

(Duration > 2sec)

Long

(Duration > 2sec)

GRB

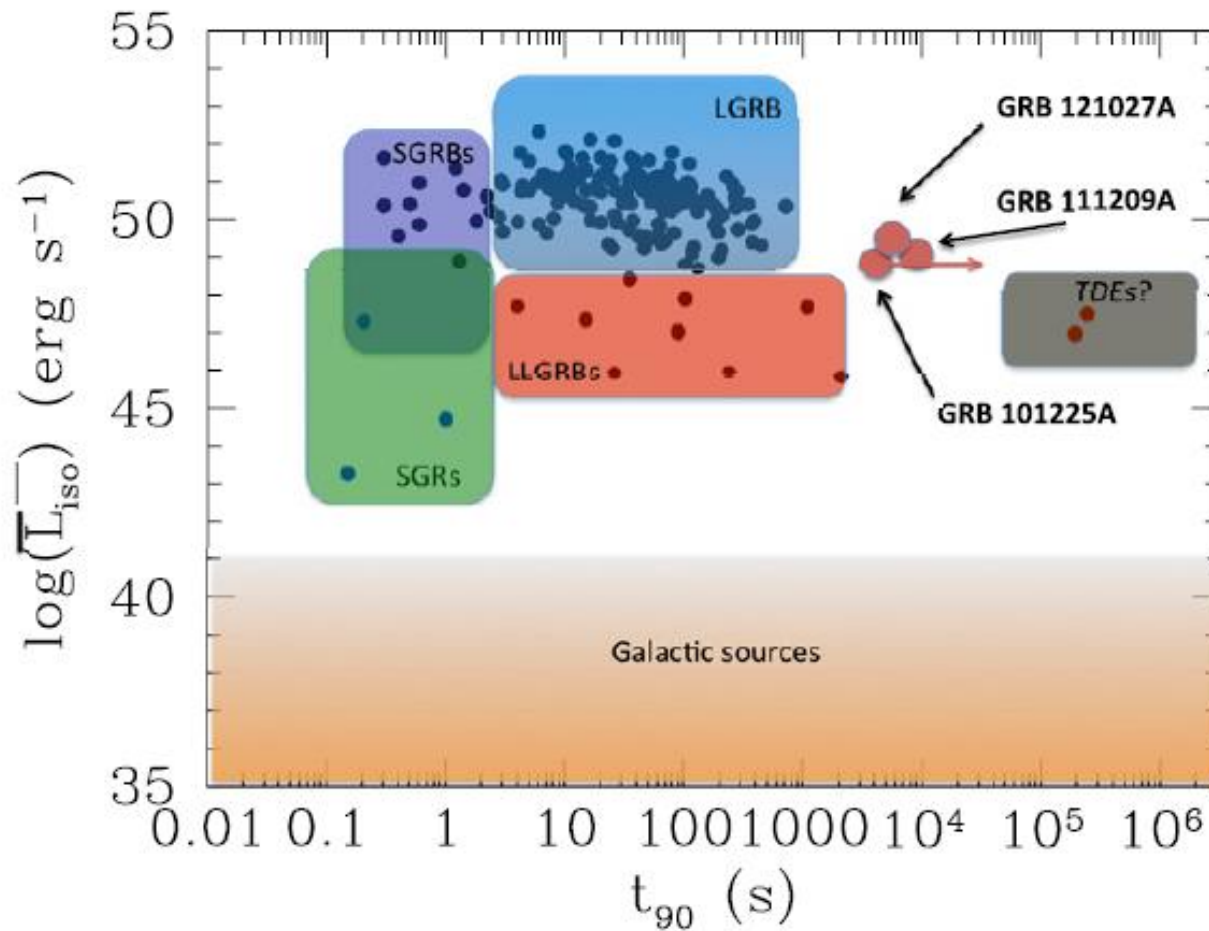
Short

(Duration < 2sec)

Ultra-Long

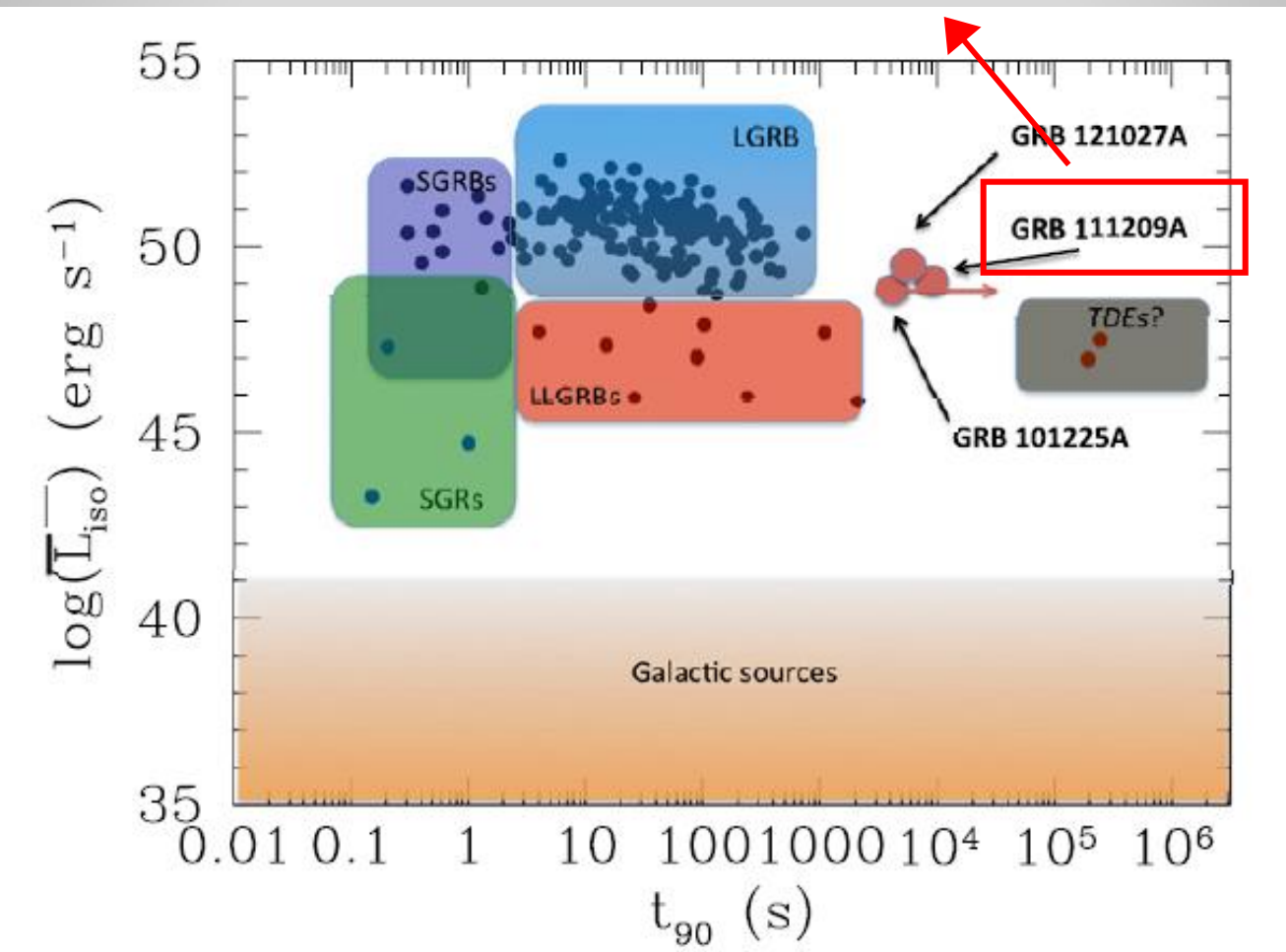
GRB

Duration > 1,000 sec



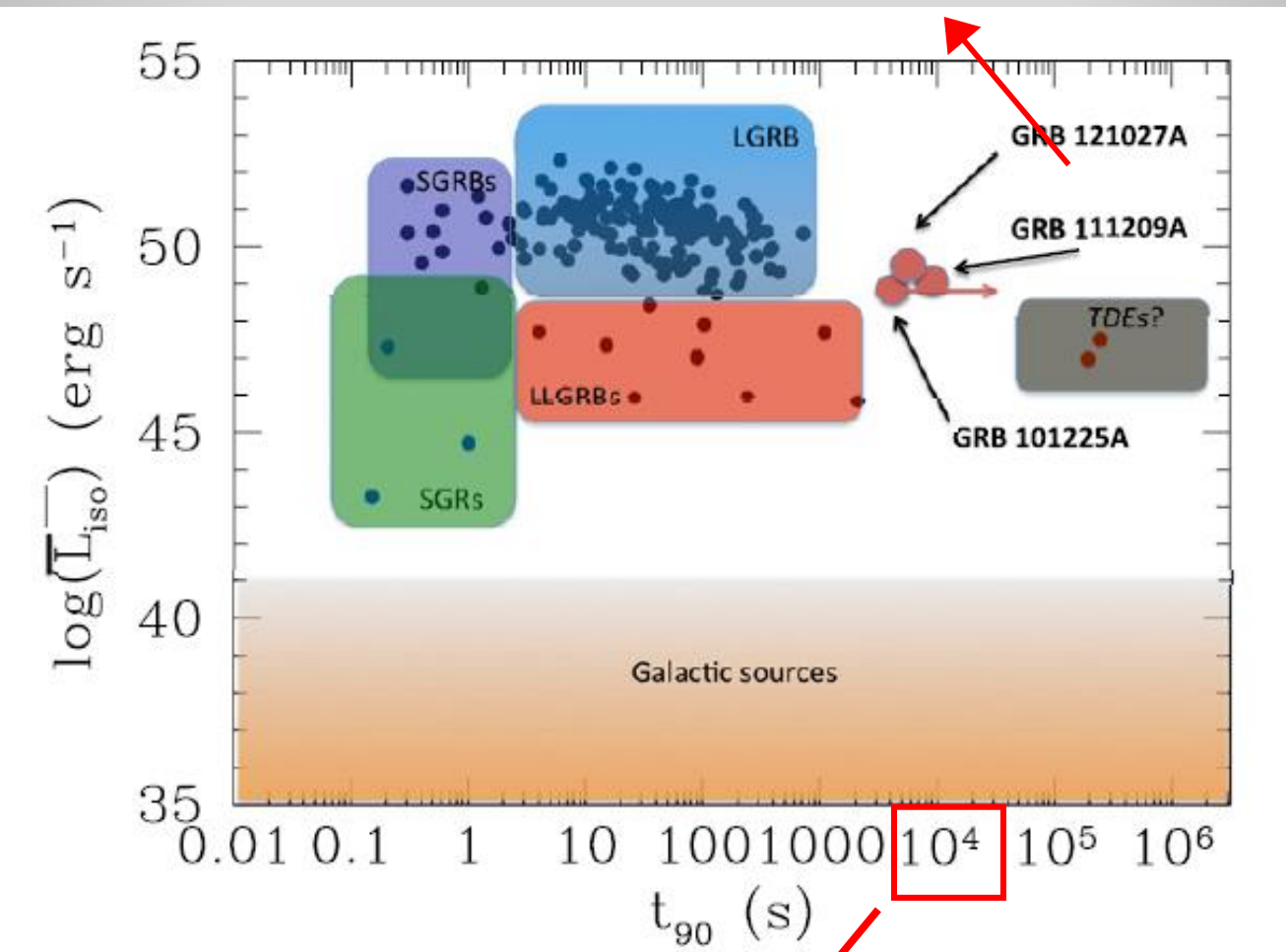
Levan et al.(2014)

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Levan et al.(2014)

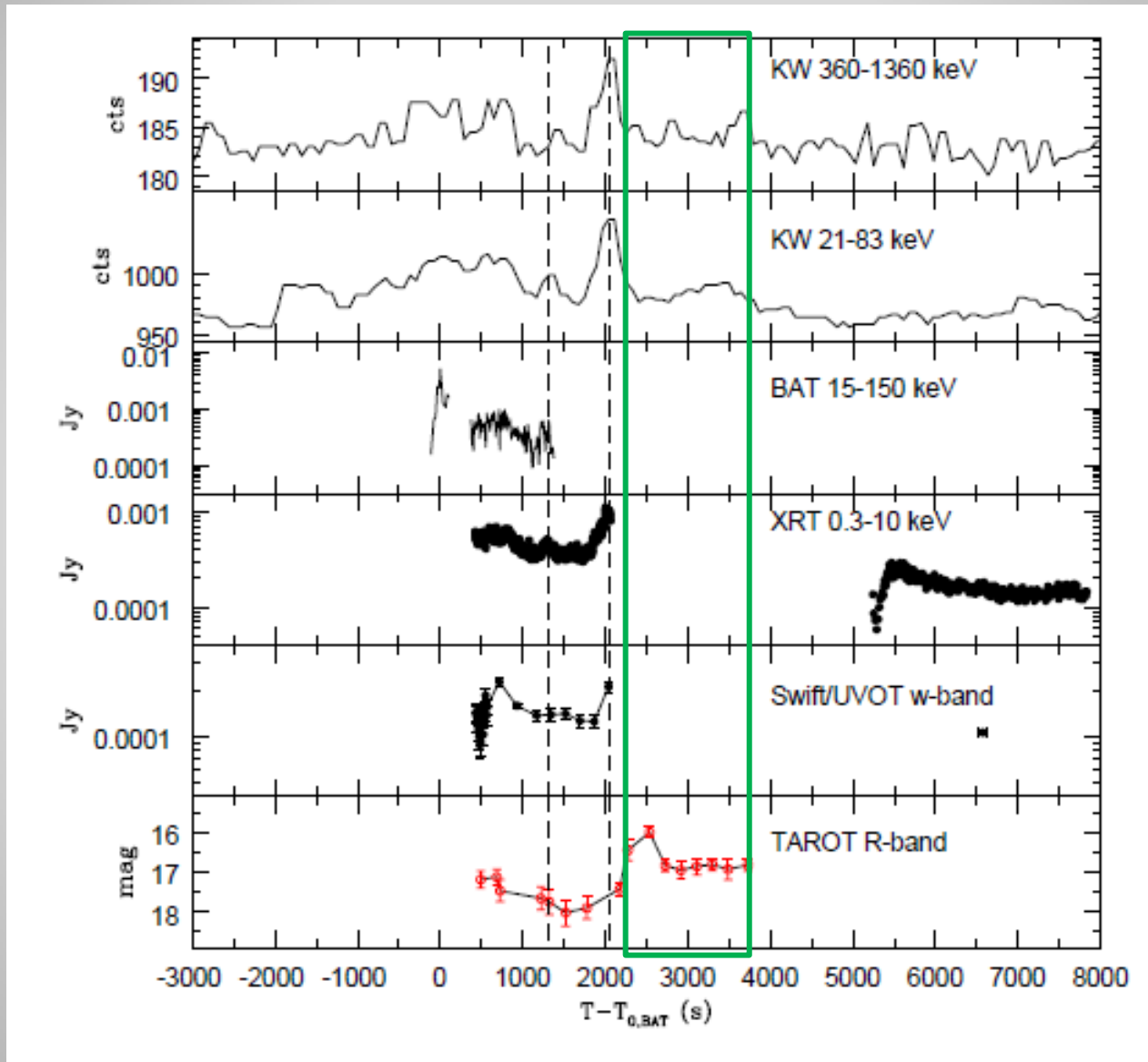
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Levan et al.(2014)

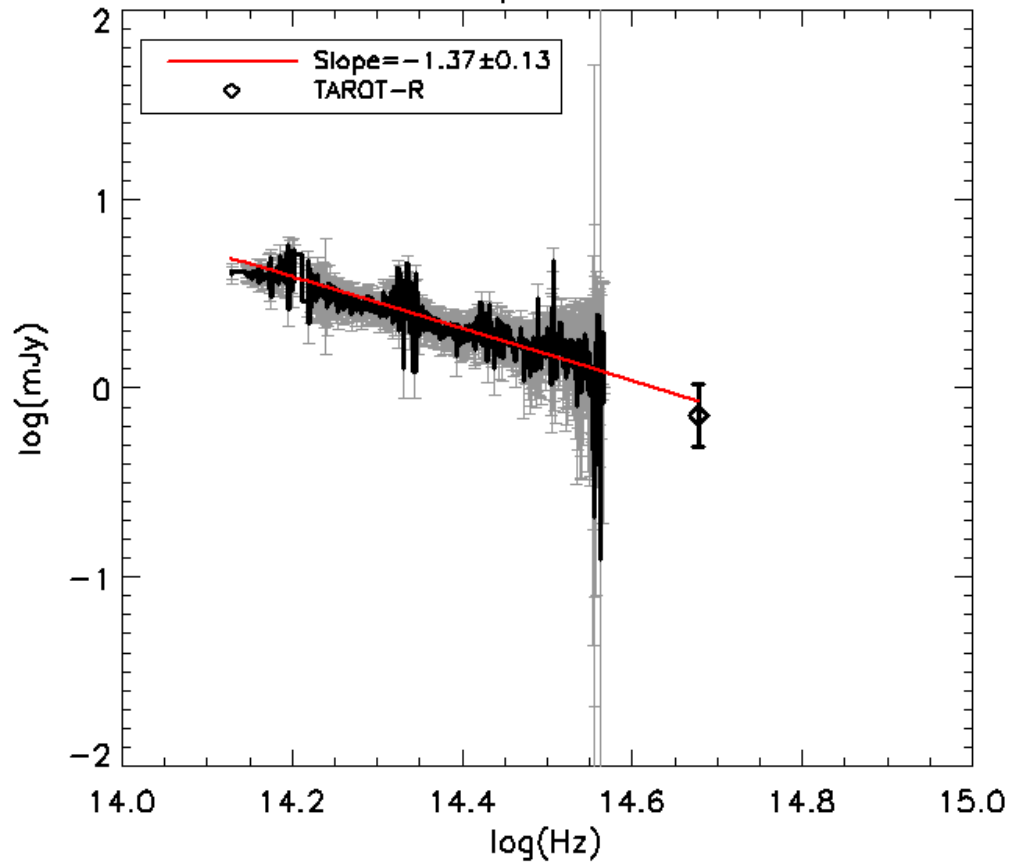
Duration $\sim 25,000$

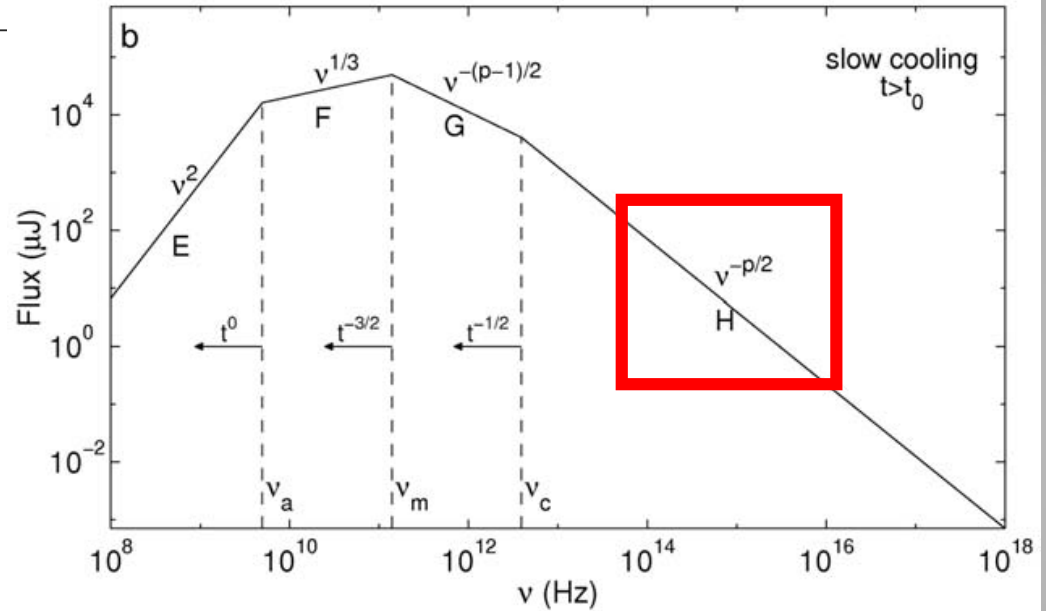
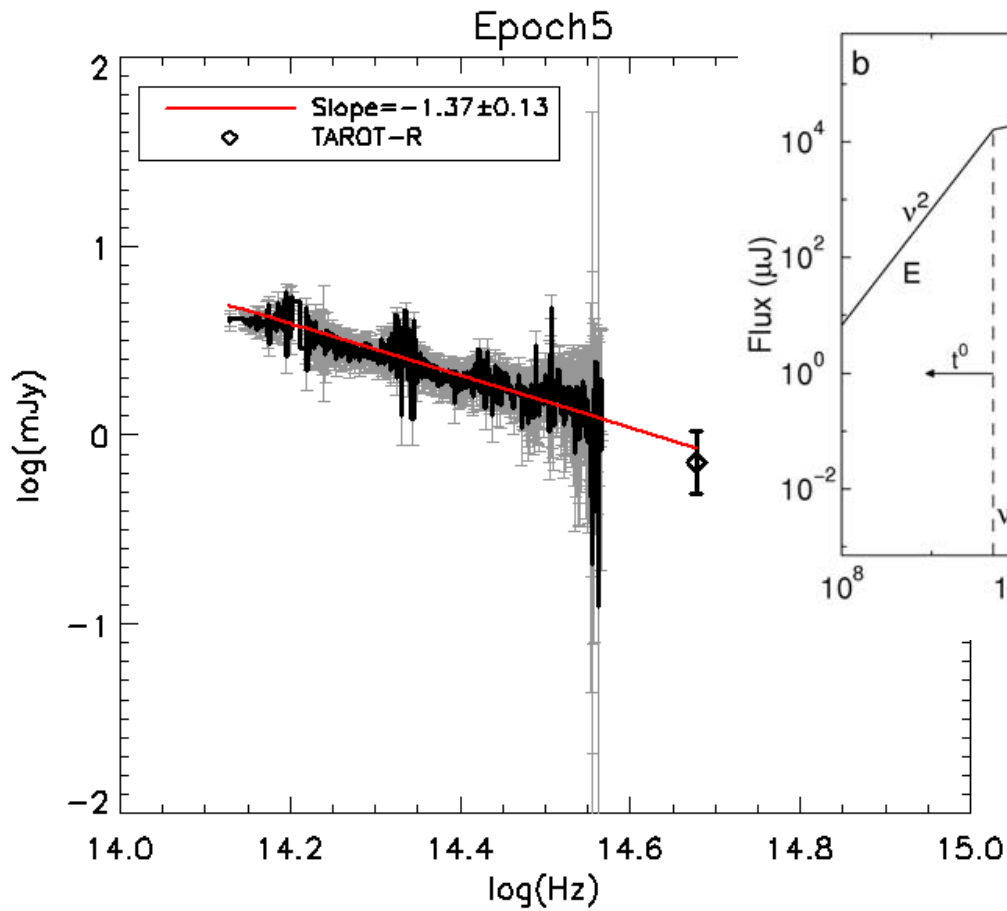
~T0+40min



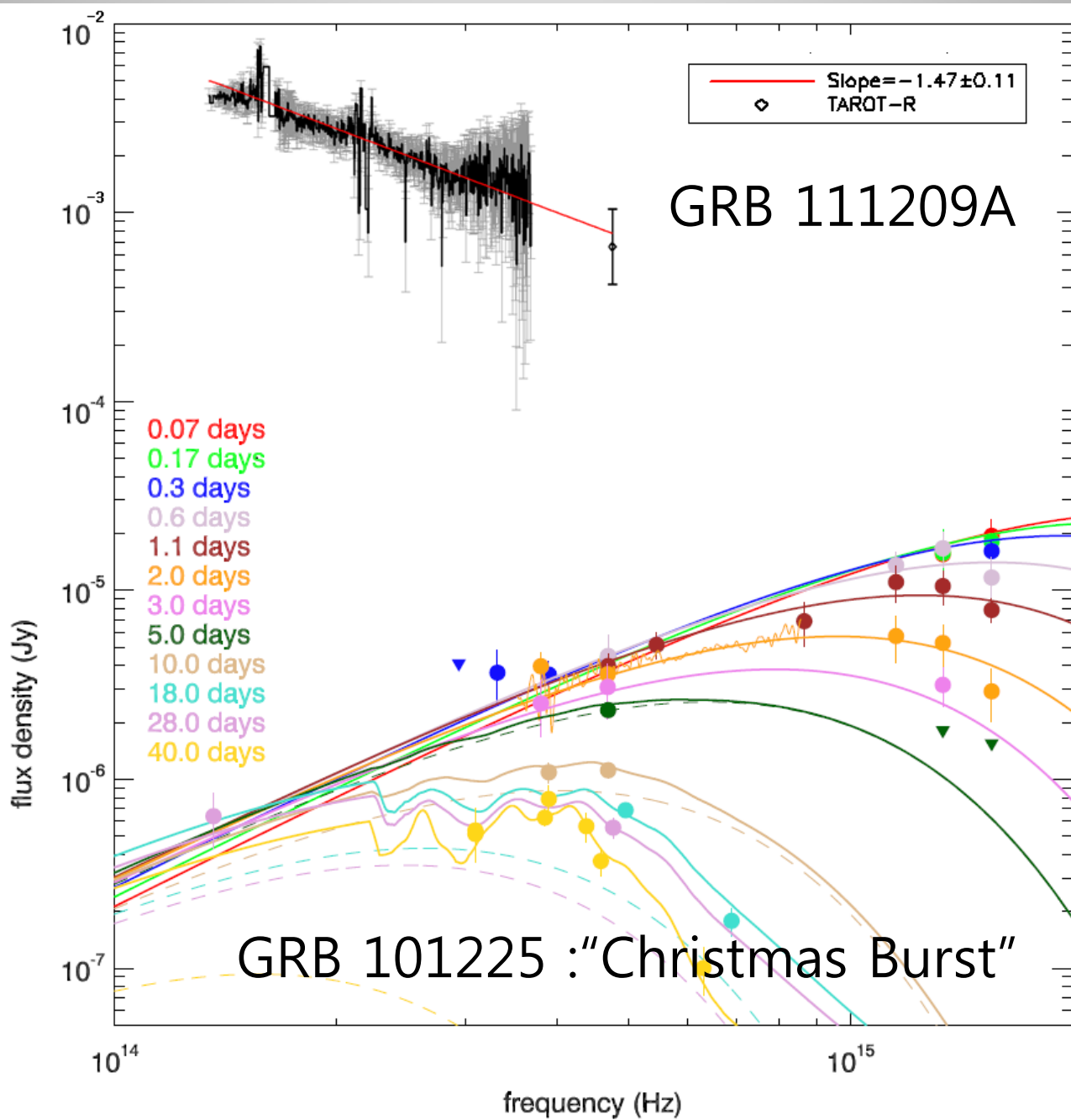
Stratta et al.(2013)

Epoch5





Early Afterglow!



Thank You!

Sang-Yun Lee