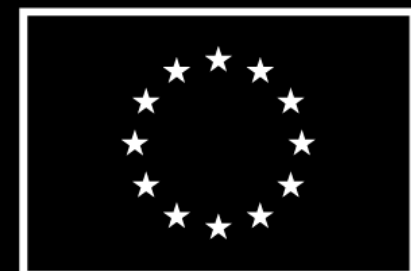




LARA NAVA

INAF - Osservatorio Astronomico di Brera

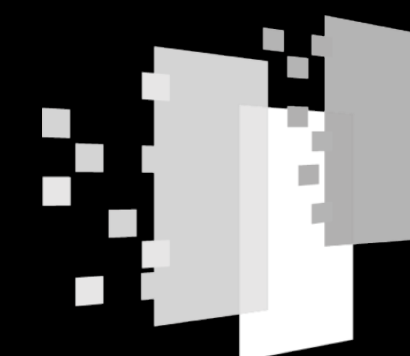
GAMMA-RAY BURSTS AT VERY HIGH ENERGIES



Finanziato
dall'Unione europea
NextGenerationEU

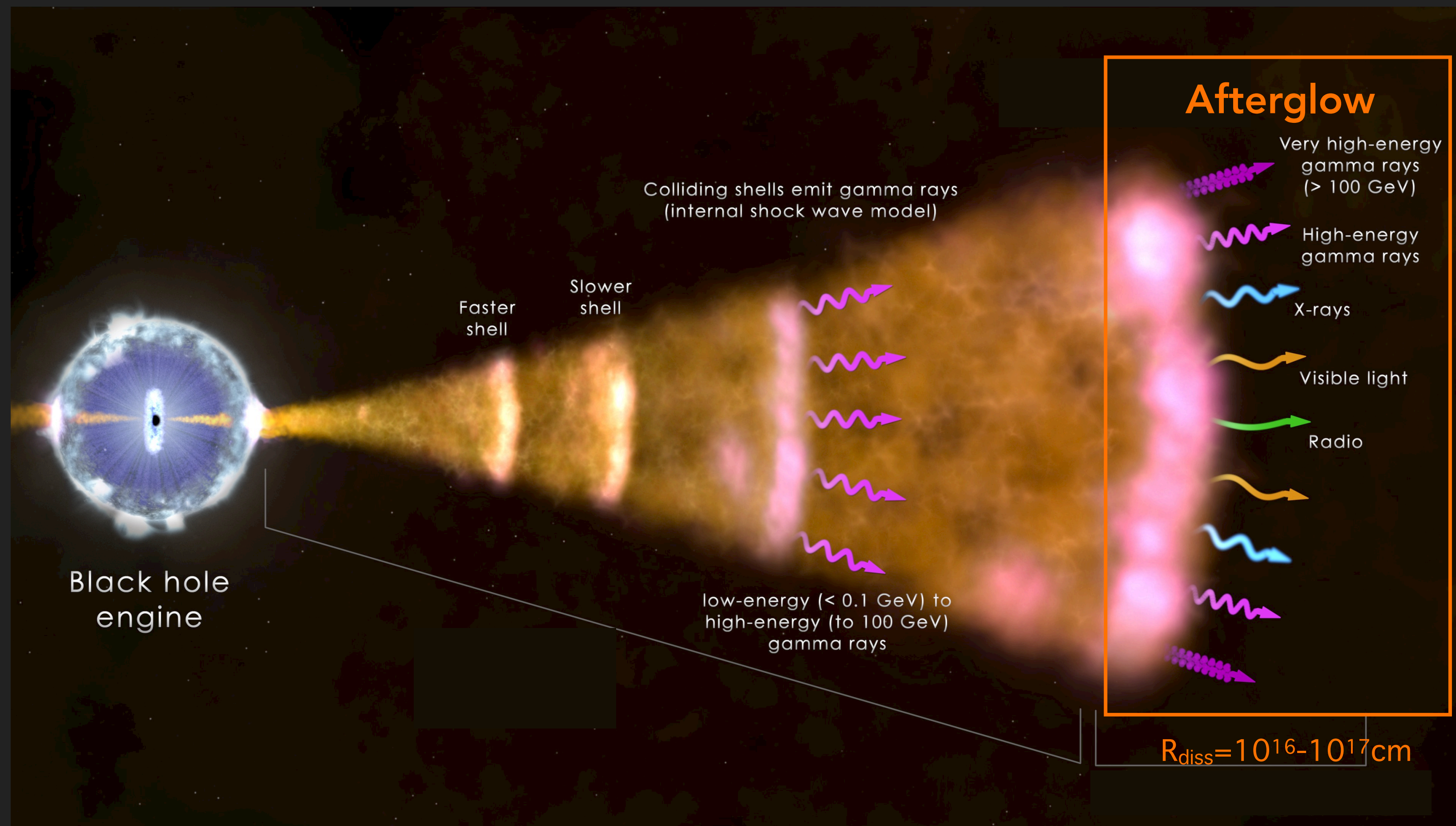


Ministero
dell'Università
e della Ricerca



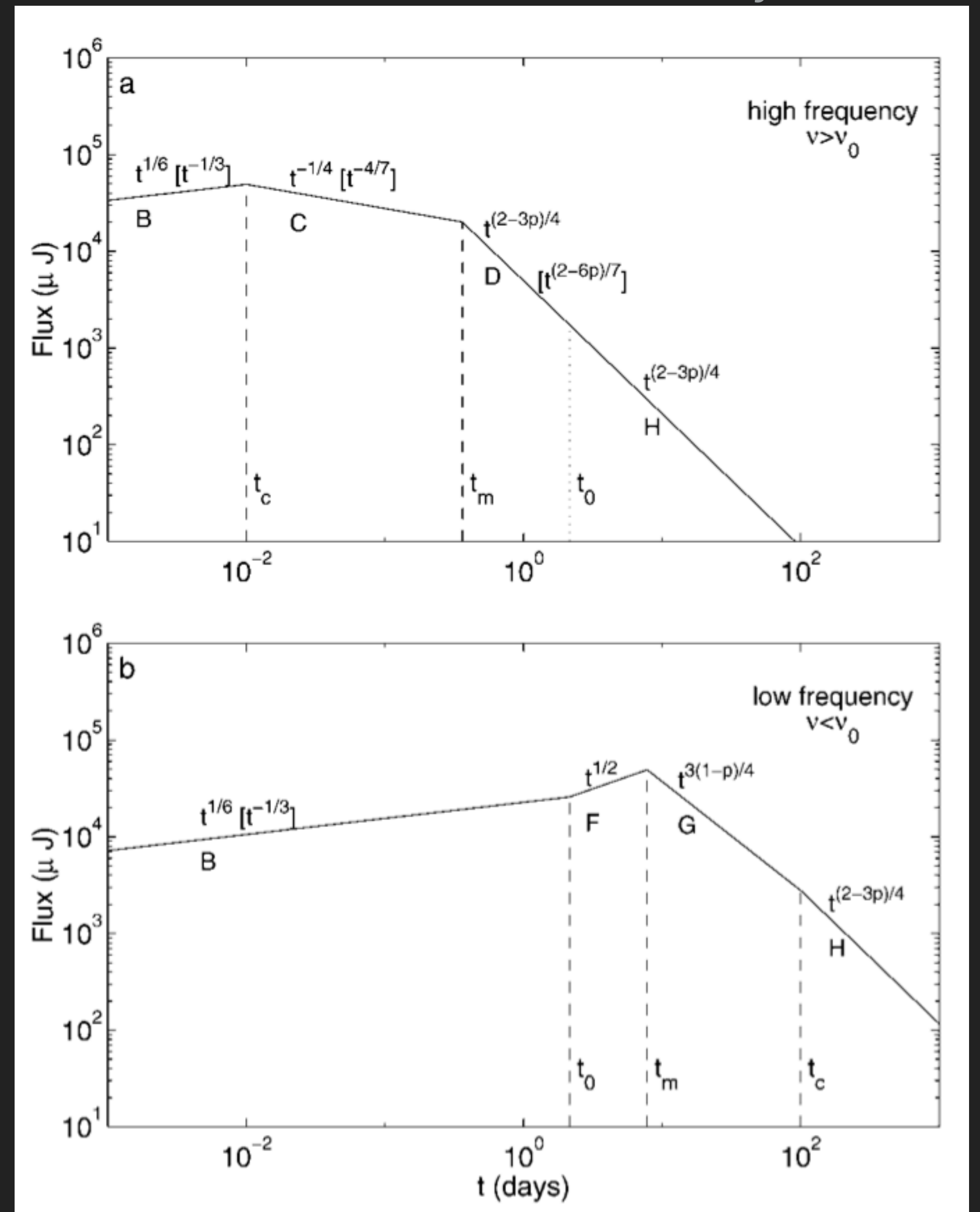
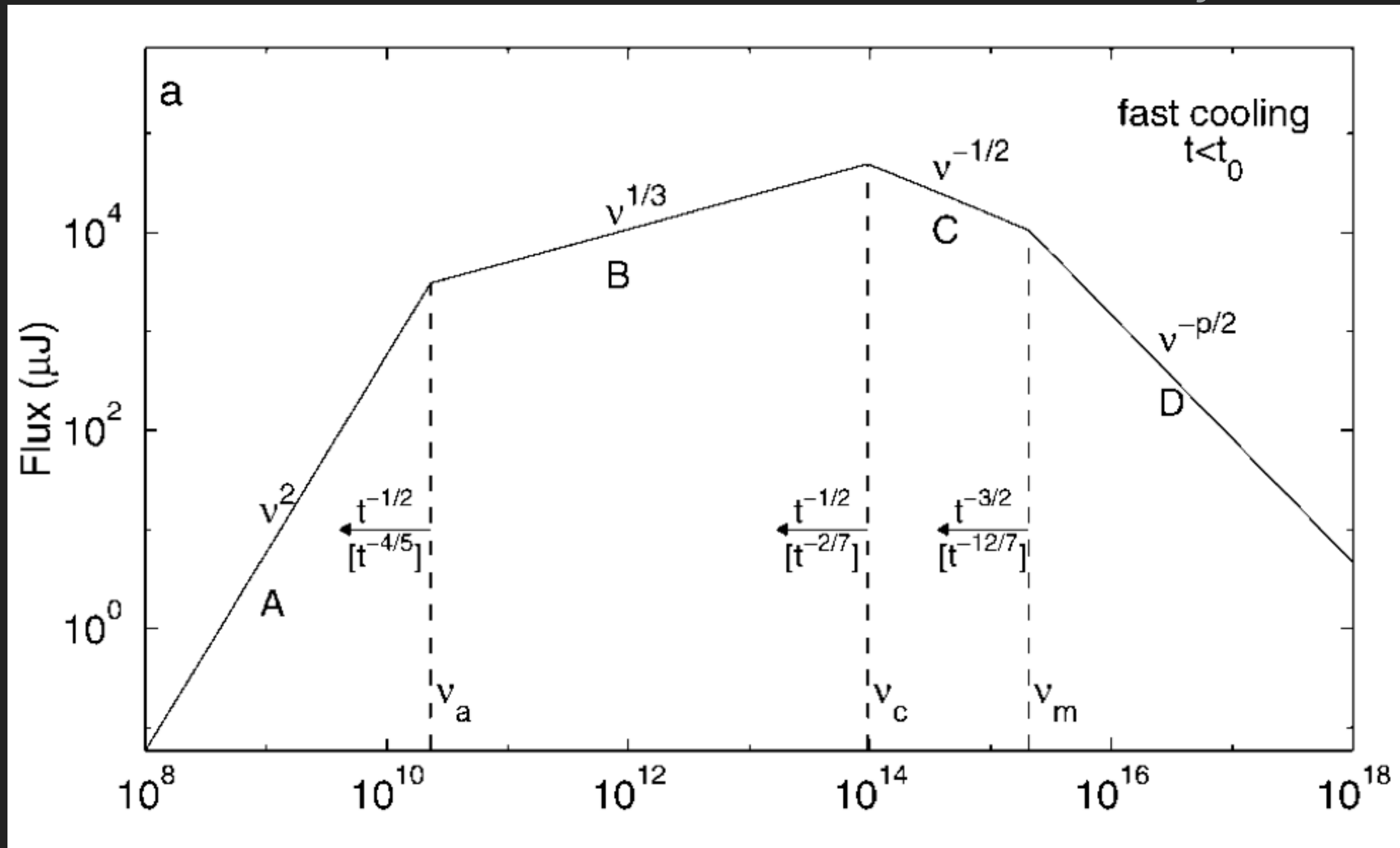
Italiadomani
PIANO NAZIONALE
DI RIPRESA E RESILIENZA

PROMPT AND AFTERGLOW EMISSION

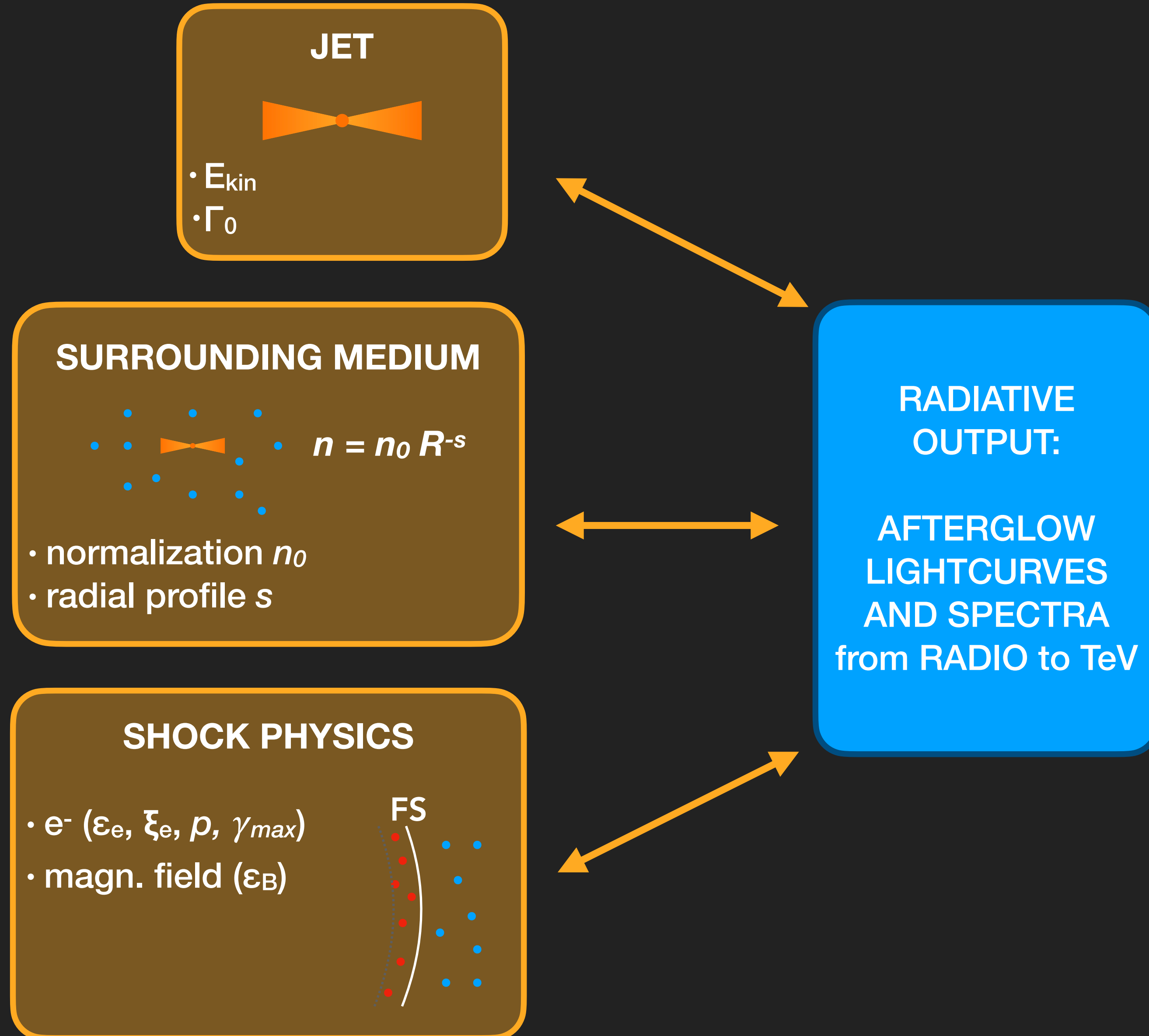


LIGHTCURVES

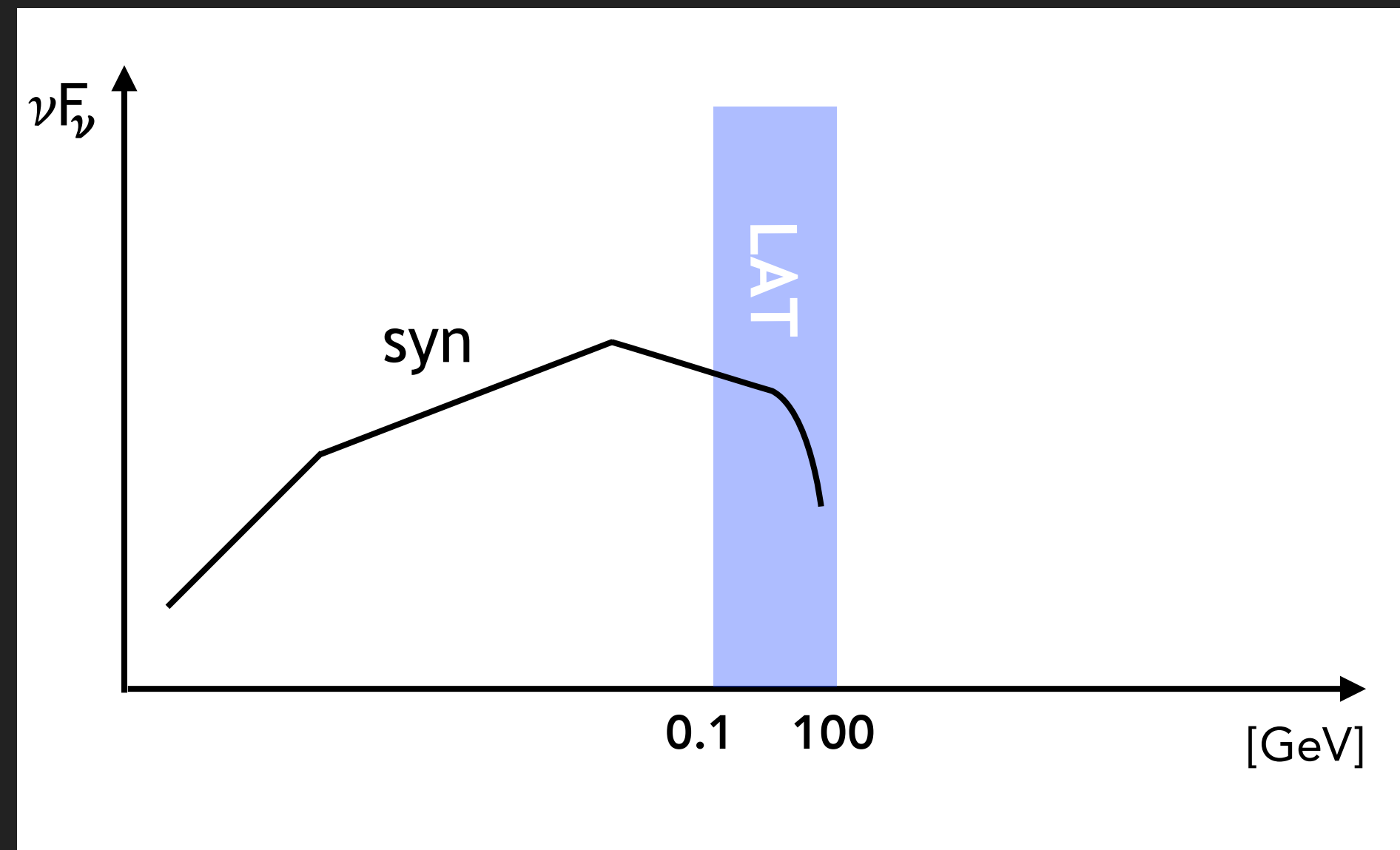
SPECTRA



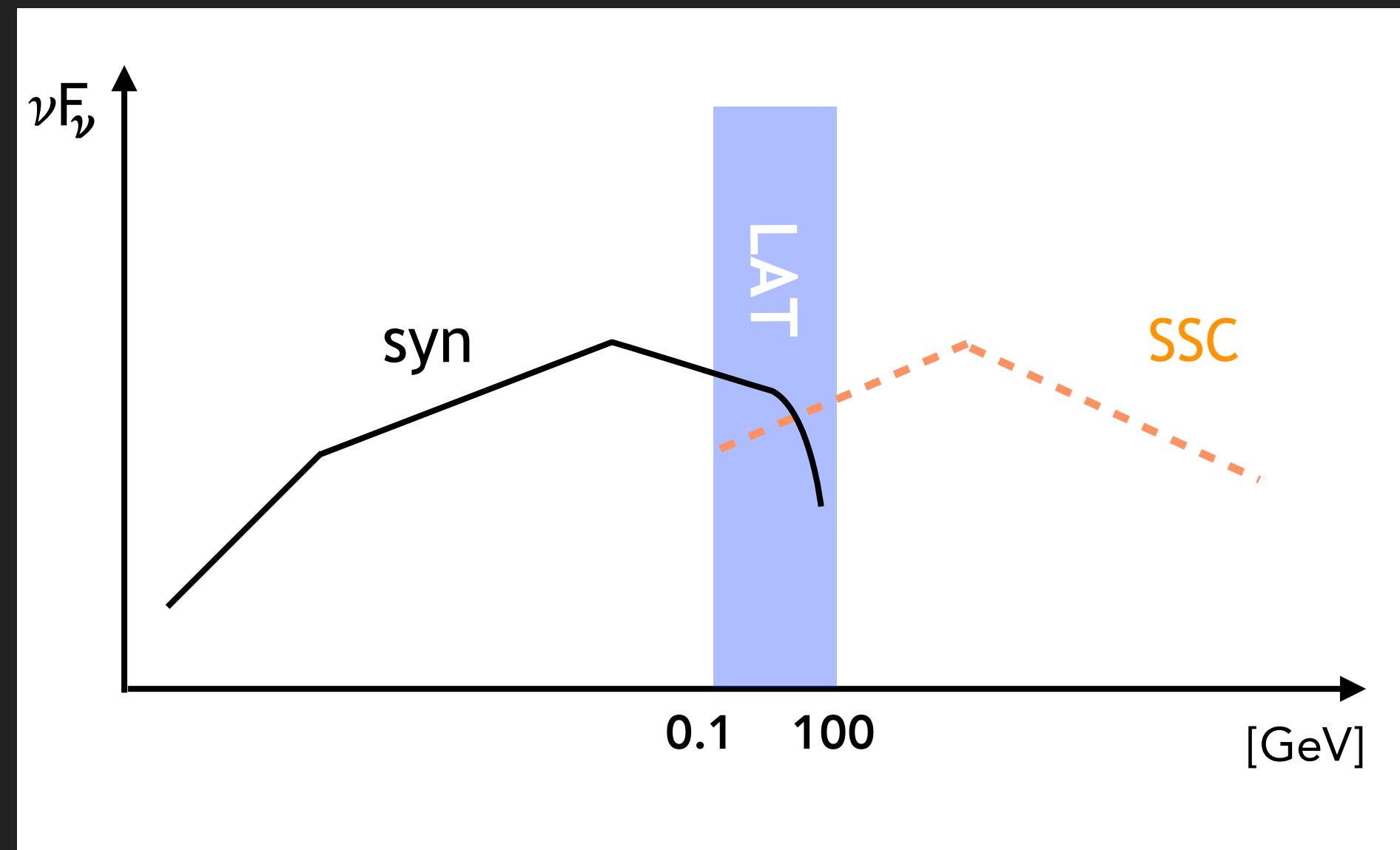
AFTERGLOW THEORY AND OPEN QUESTIONS



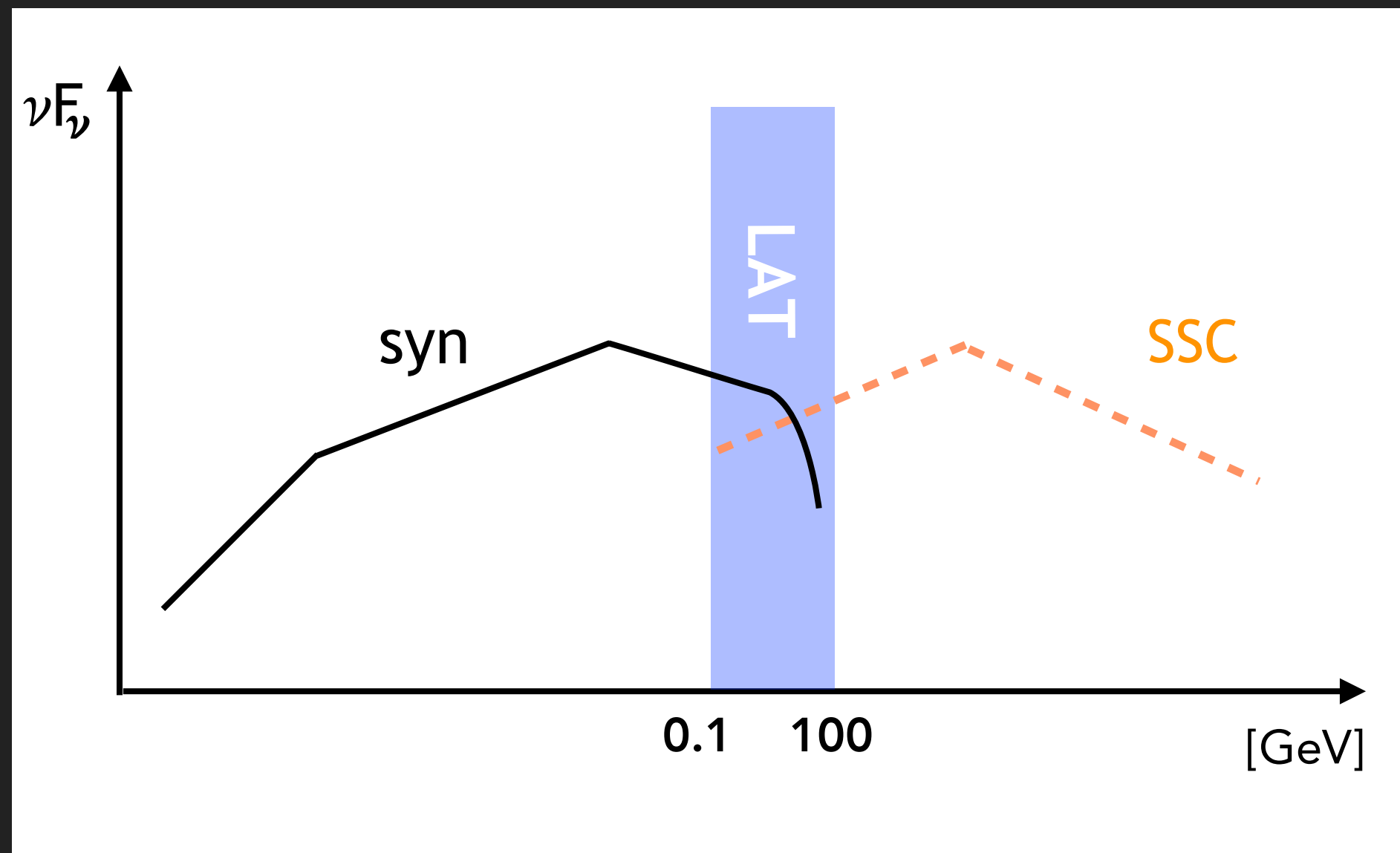
SECOND SPECTRAL COMPONENT?



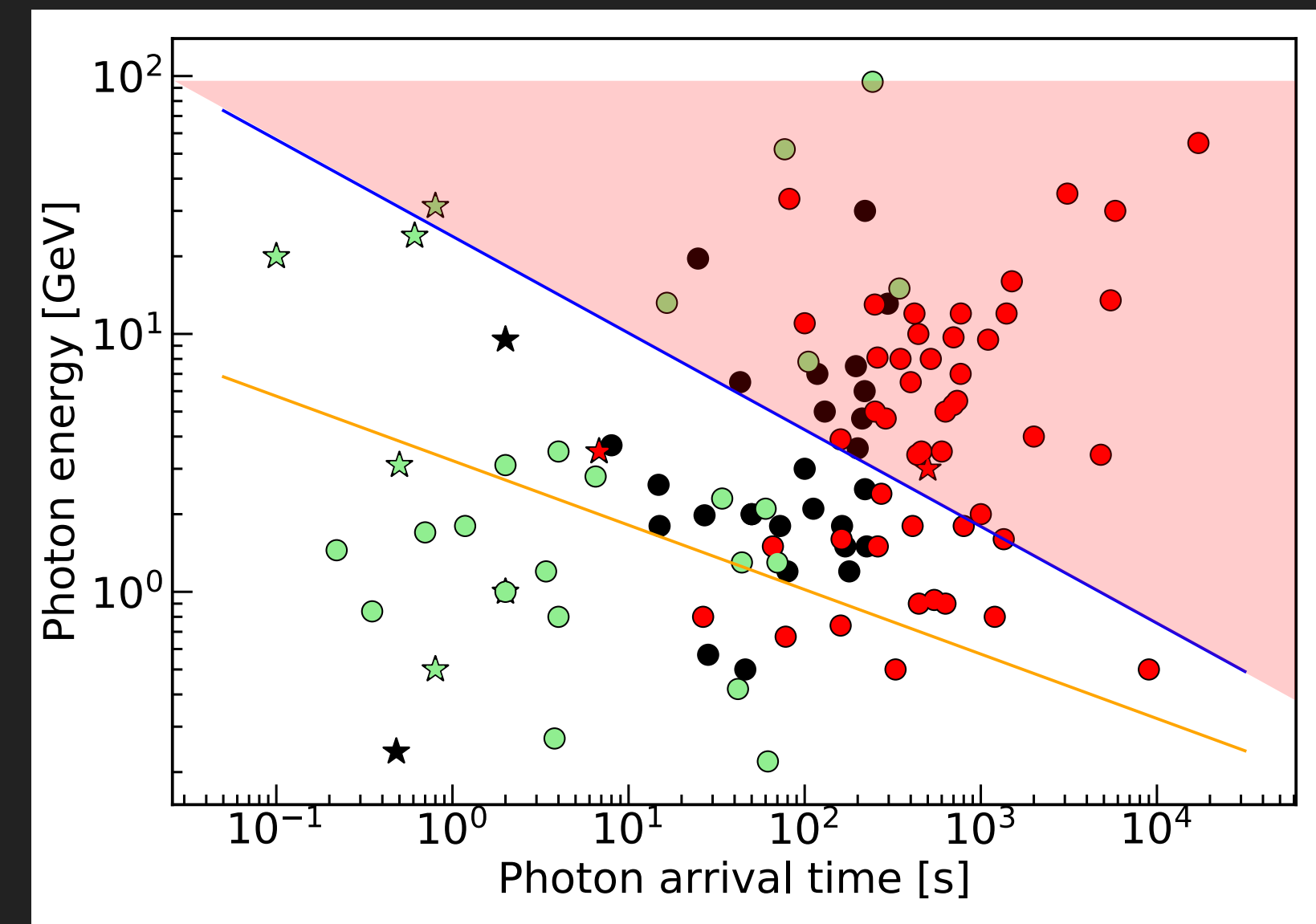
SECOND SPECTRAL COMPONENT?



SECOND SPECTRAL COMPONENT?

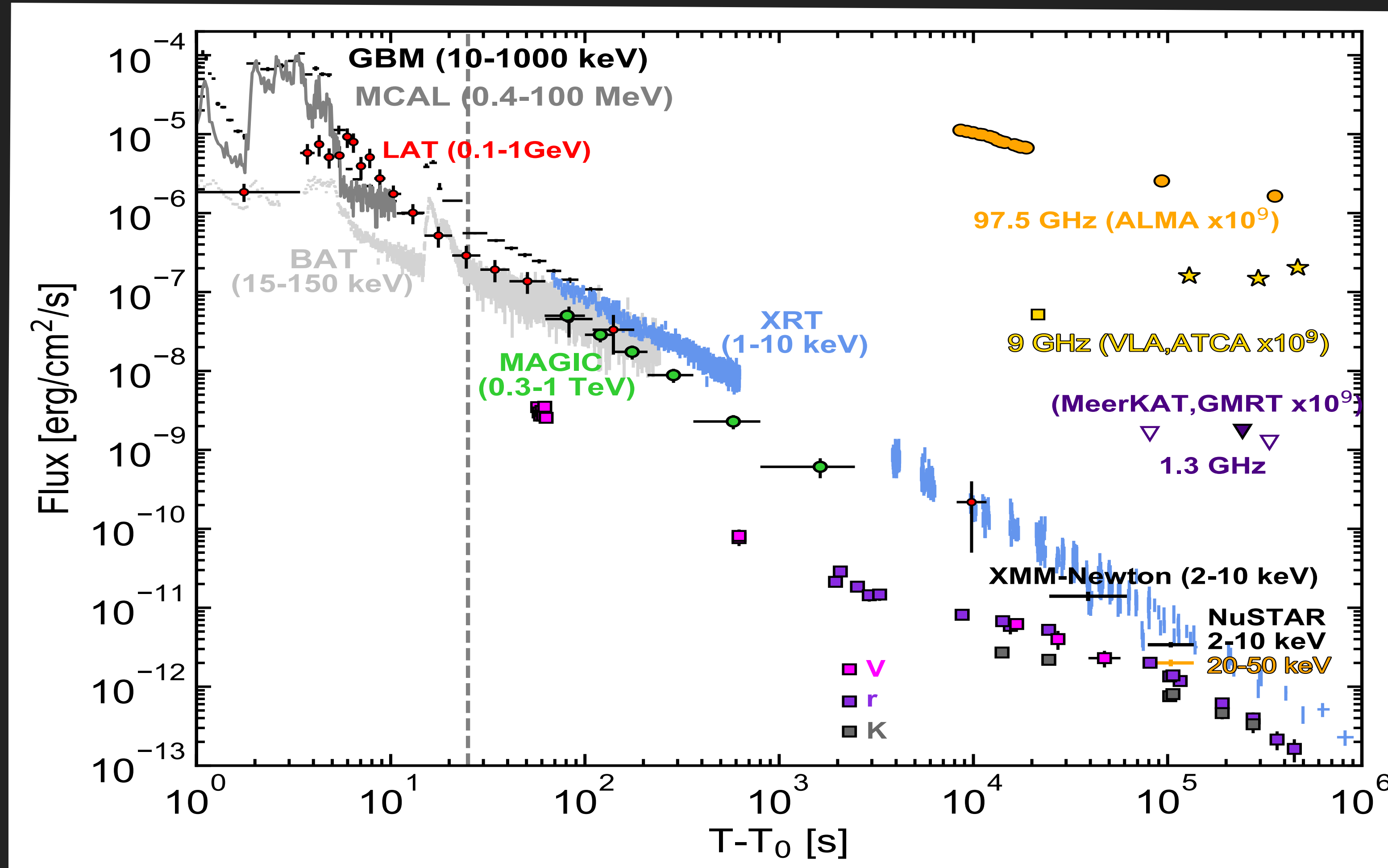


Nava 2018



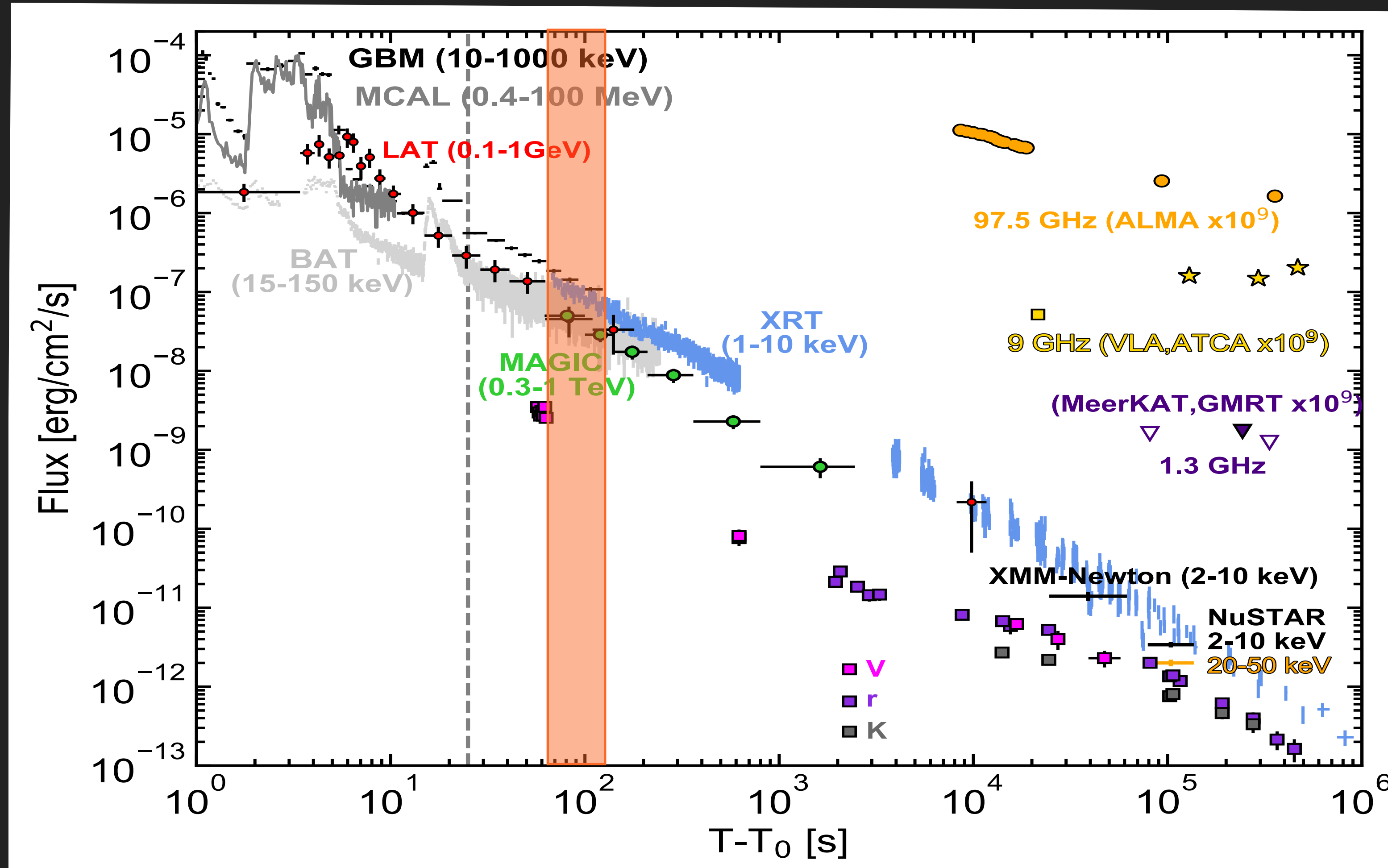
190114C (MAGIC, $Z=0.42$)

MAGIC Collab. et al. 2019, Nature, 575, 459



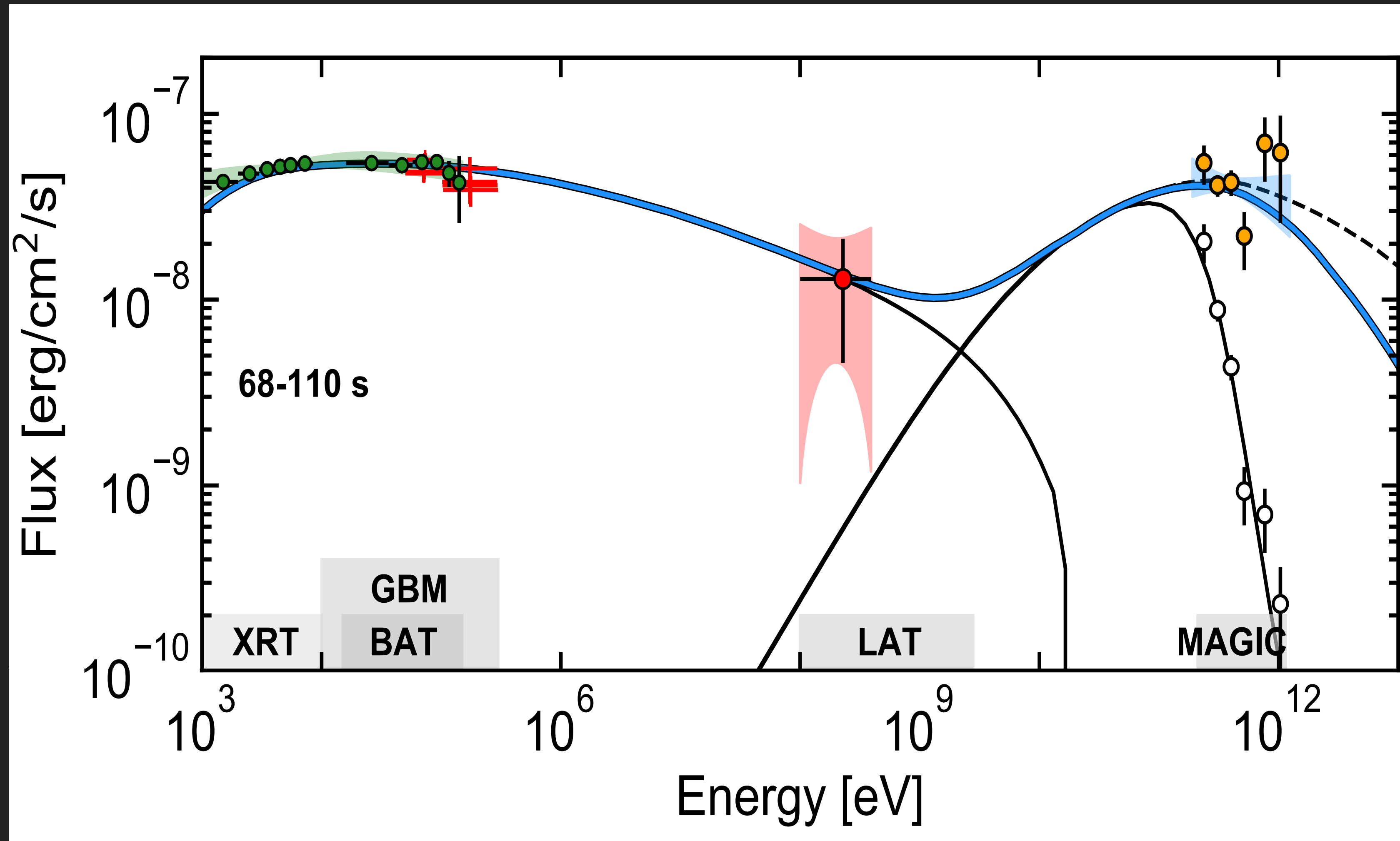
190114C (MAGIC, $Z=0.42$)

MAGIC Collab. et al. 2019, Nature, 575, 459



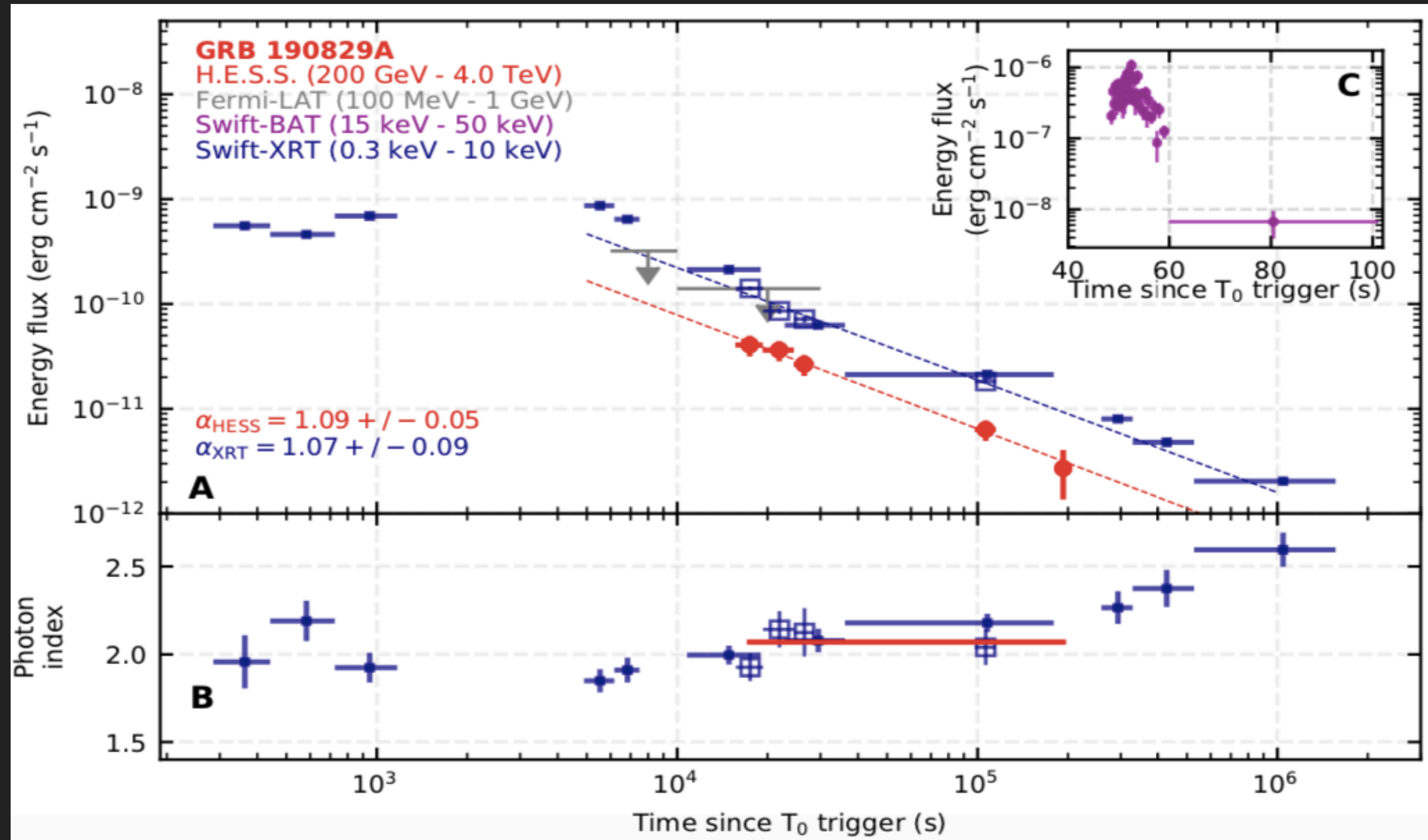
DOUBLE COMPONENT IN AFTERGLOW SED?

MAGIC 2019, Nature, 575, 459



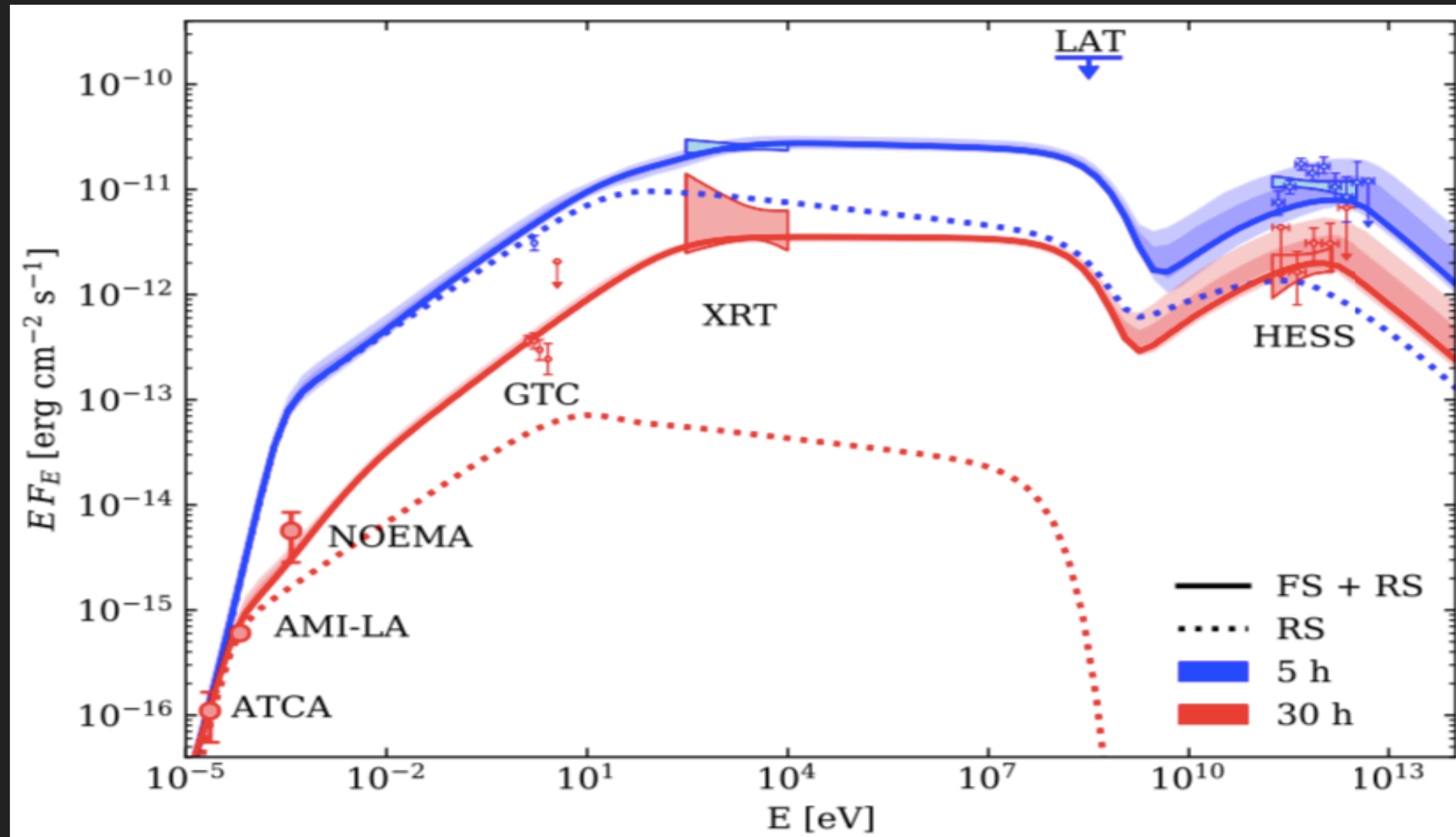
190829A (HESS, $Z=0.078$)

HESS Collab, 2021, Science 372, 1081



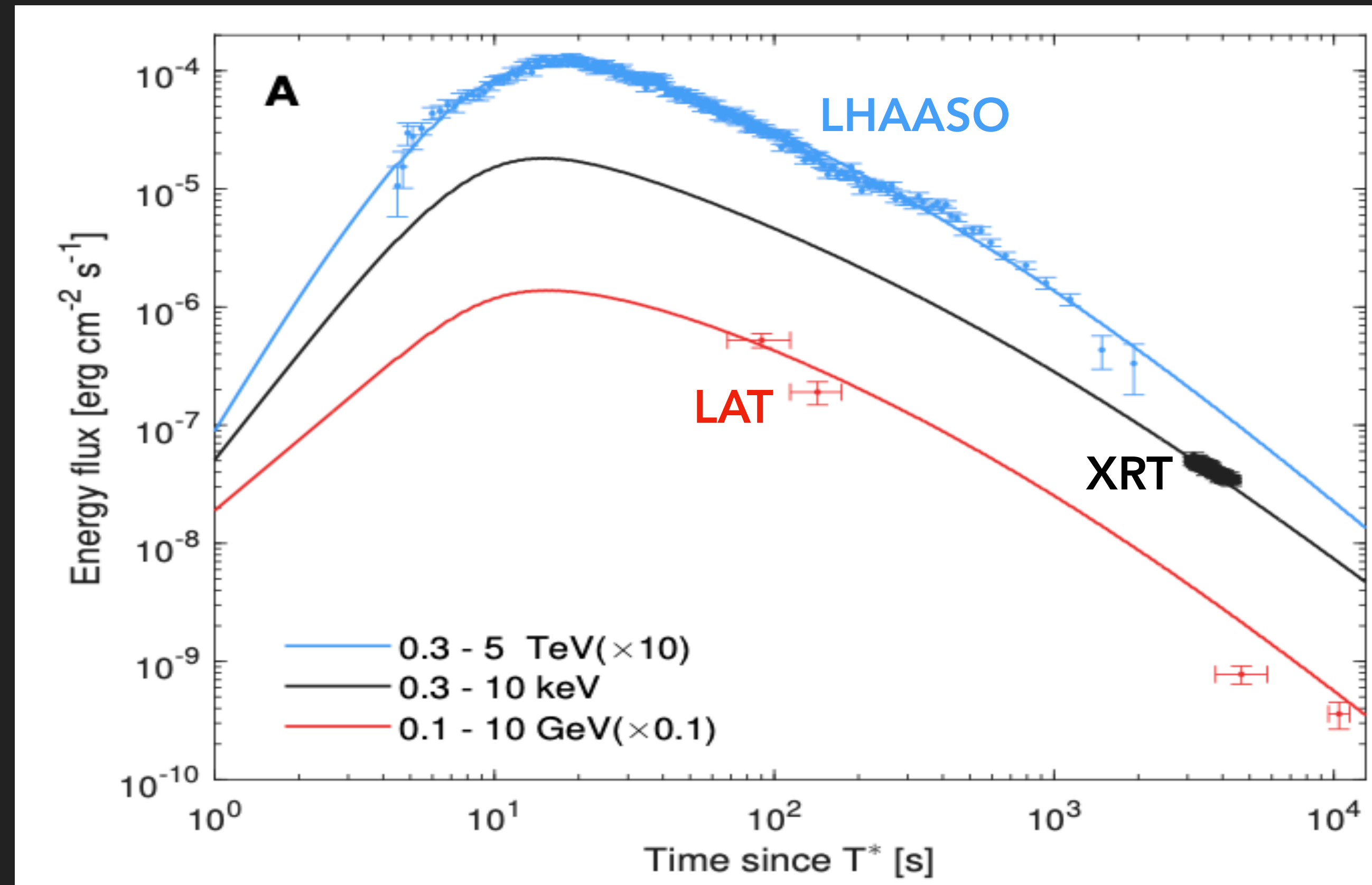
190829A (HESS, $Z=0.078$)

Salafia, ..., LN, 2022, ApJ, 931L, 19



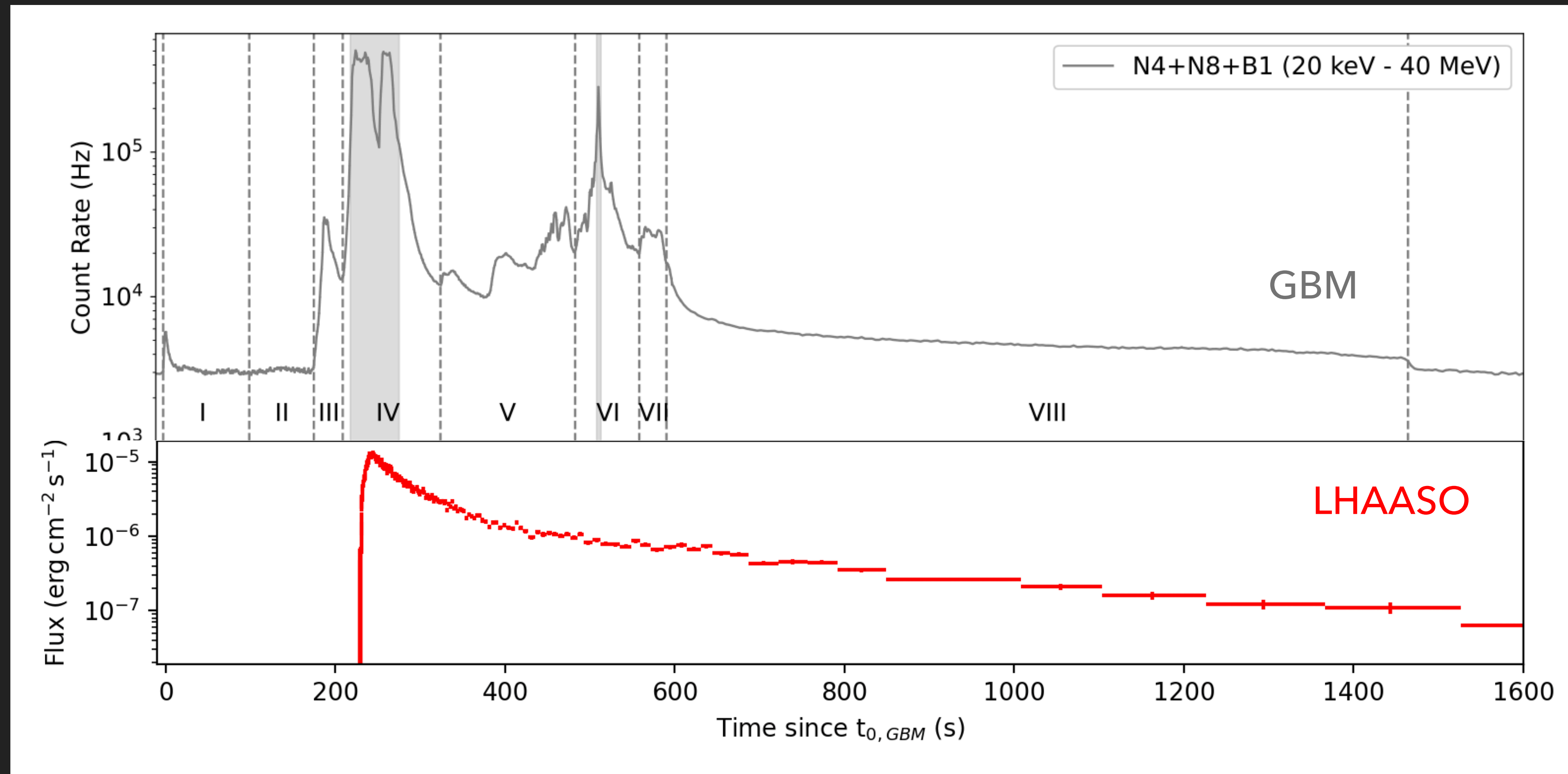
221009A (LHAASO, $Z=0.151$)

LHAASO Collab. 2023, 380, 6652



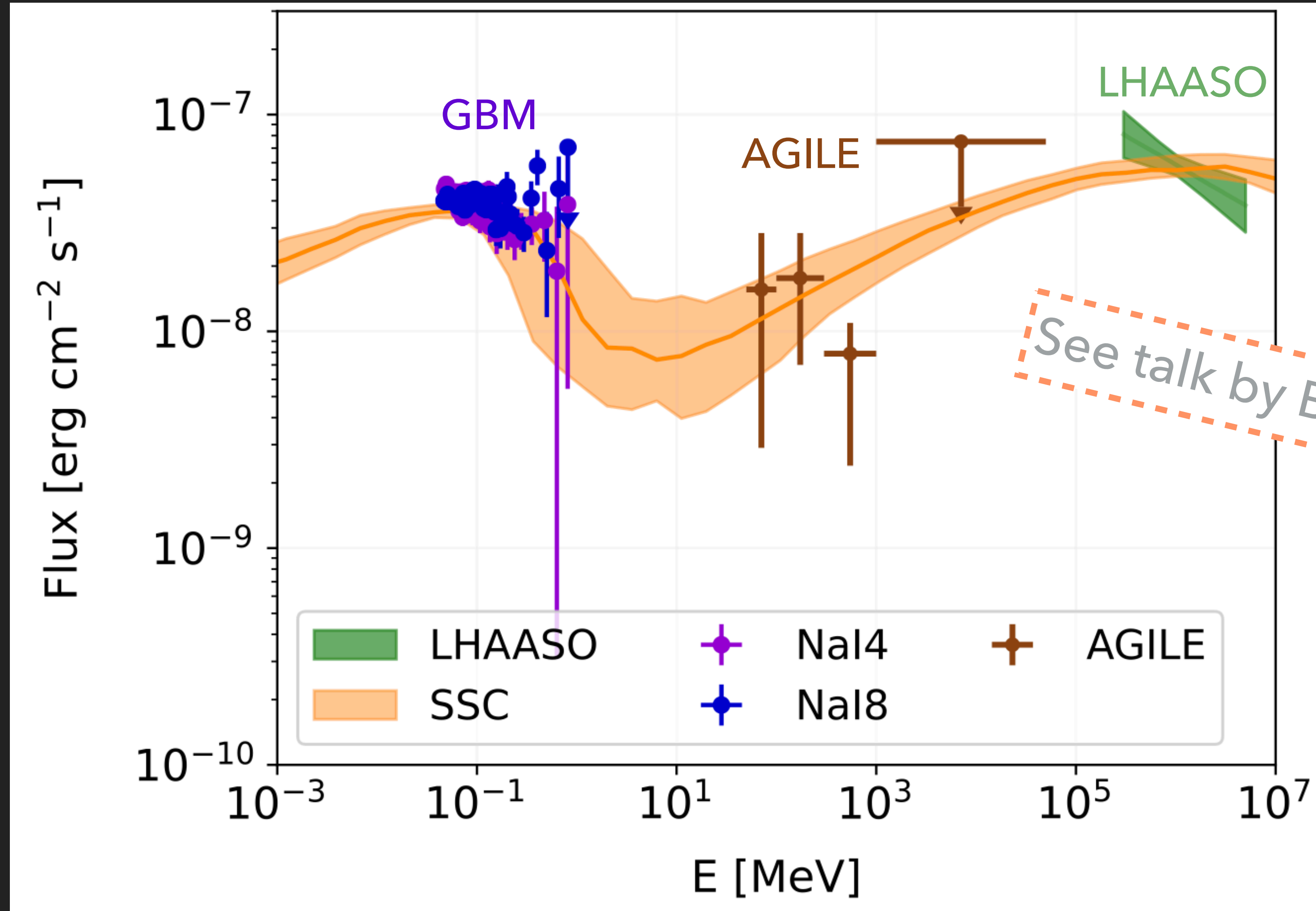
DOUBLE COMPONENT IN AFTERGLOW SED?

Lesage et al. 2023, ApJ, 952, 42



AFTERGLOW SED IN 221009A

Banerjee et al., 2024, submitted, arXiv:240515855



WHAT ARE WE LEARNING FROM TEV OBSERVATIONS?

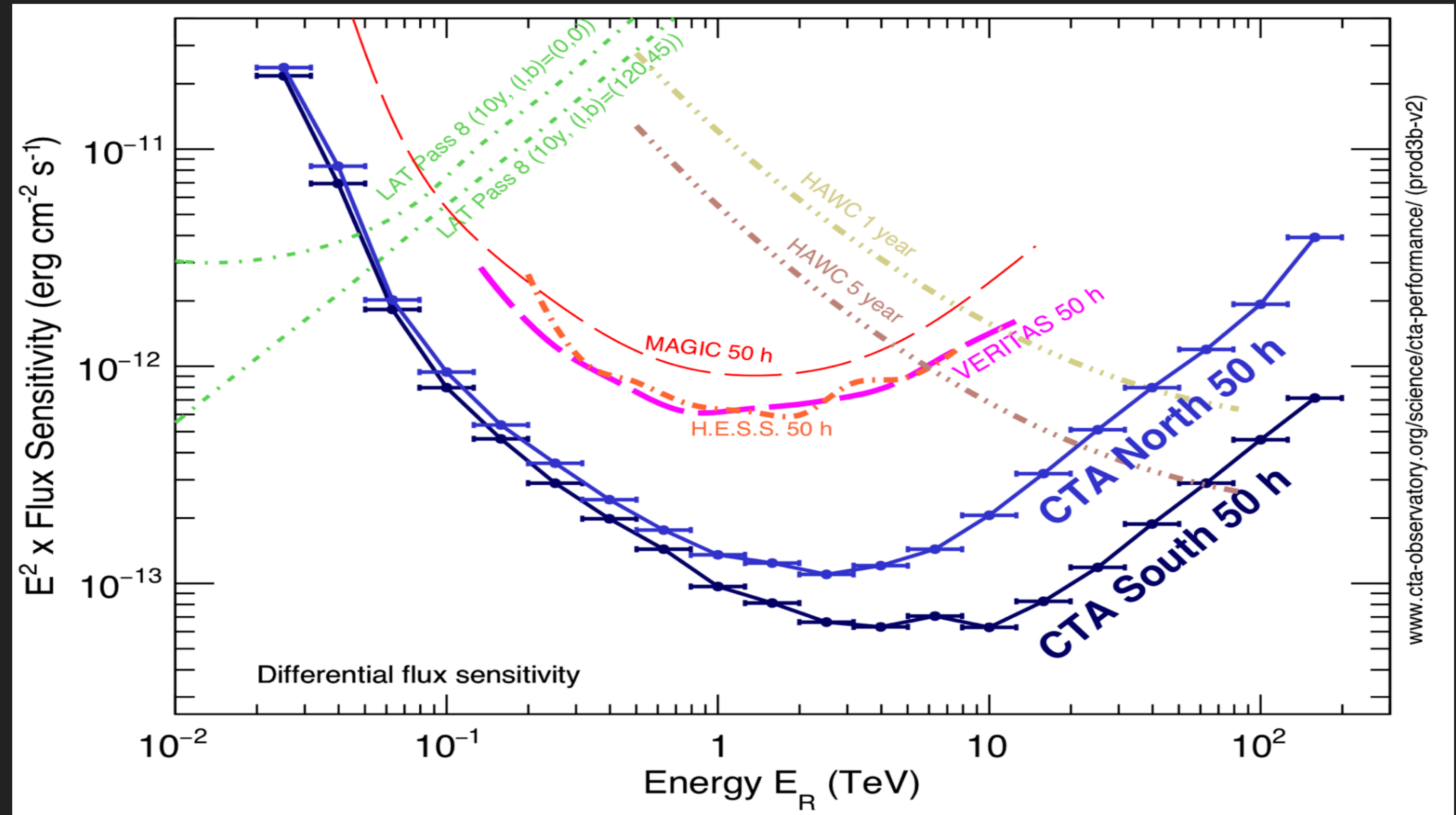
- ▶ energy budget
- ▶ magnetic field
- ▶ maximum electron energy
- ▶ acceleration efficiency

CTAO

LST: 20 GeV - 3 TeV

MST: 80 GeV - 50 TeV

SST: 1 TeV - 300 TeV

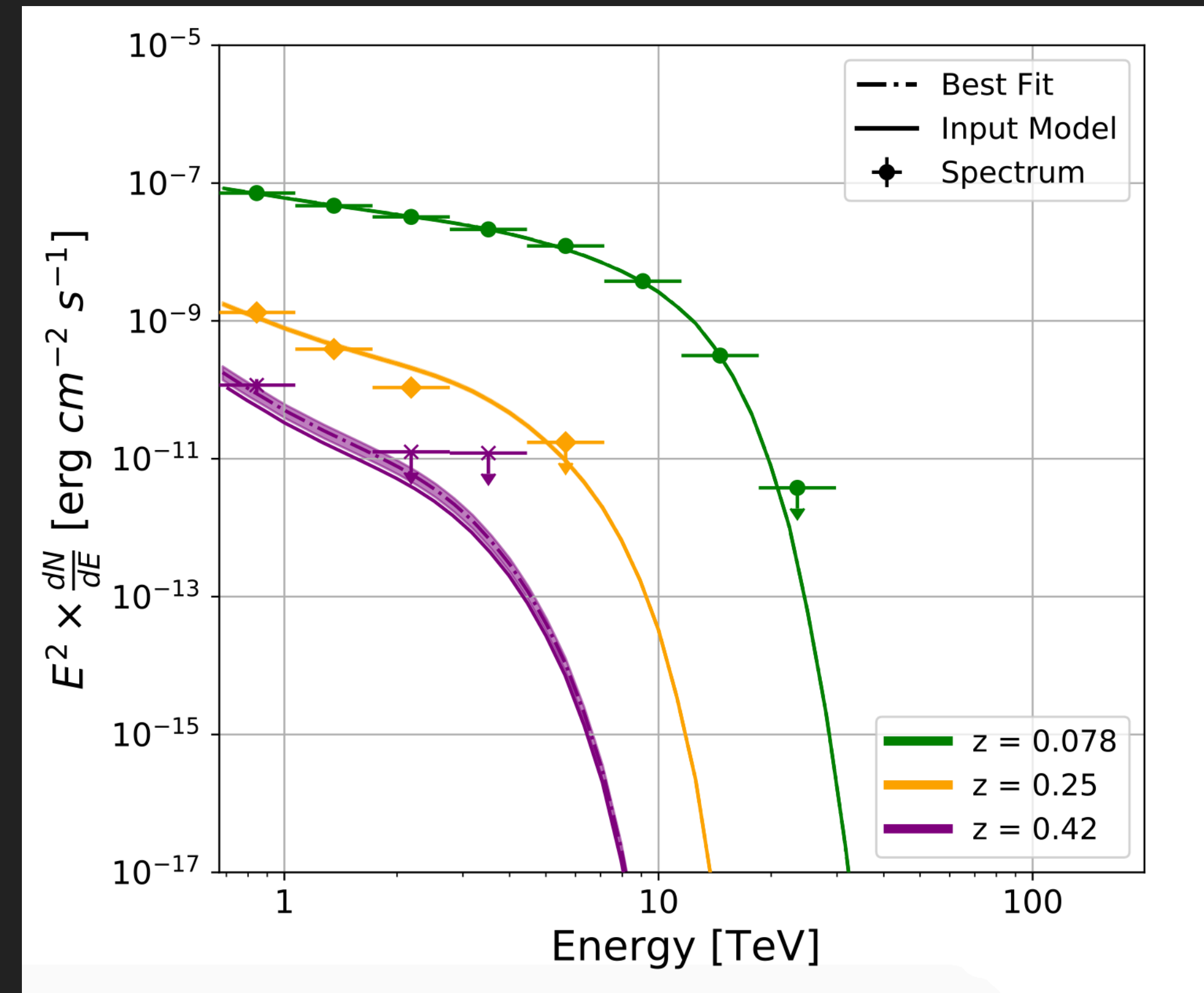


Consortium paper on prospects for CTAO observations of GRB
in preparation

GRB SIMULATIONS WITH THE ASTRI MINI-ARRAY

THREE SIMULATIONS:

- 190114C as a template
- moved at 3 different z :
 - $z = 0.42$ (original z)
 - $z = 0.25$
 - $z = 0.078$ (same as HESS GRB 190829A)



Vercellone et al., JHEAp, 35, 1 (2022)

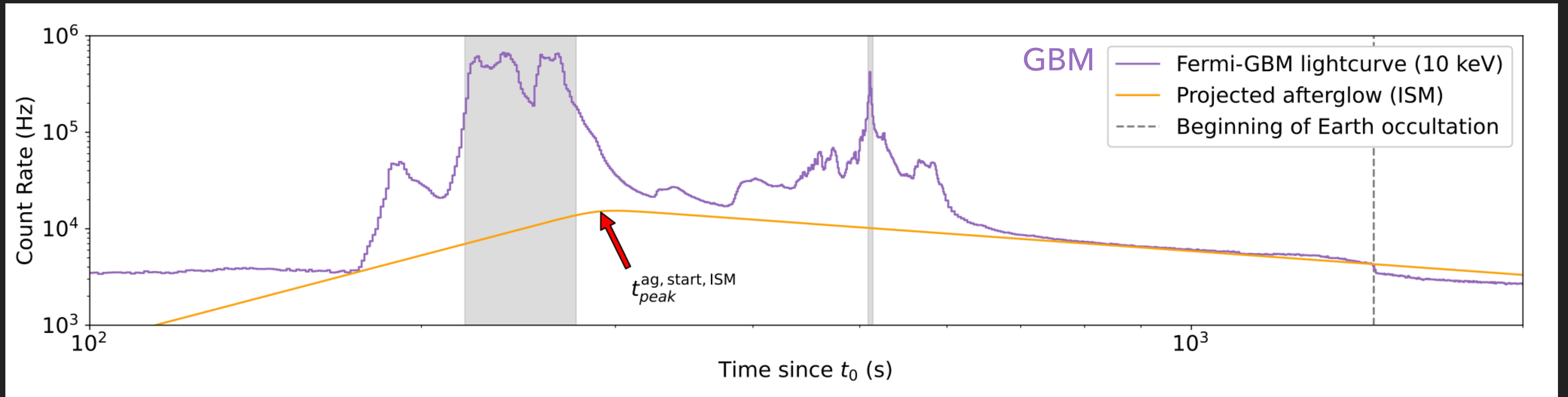
ASTRI Mini-Array core science at the Observatorio del Teide

Back up slides

RELEVANCE OUTSIDE THE GRB FIELD

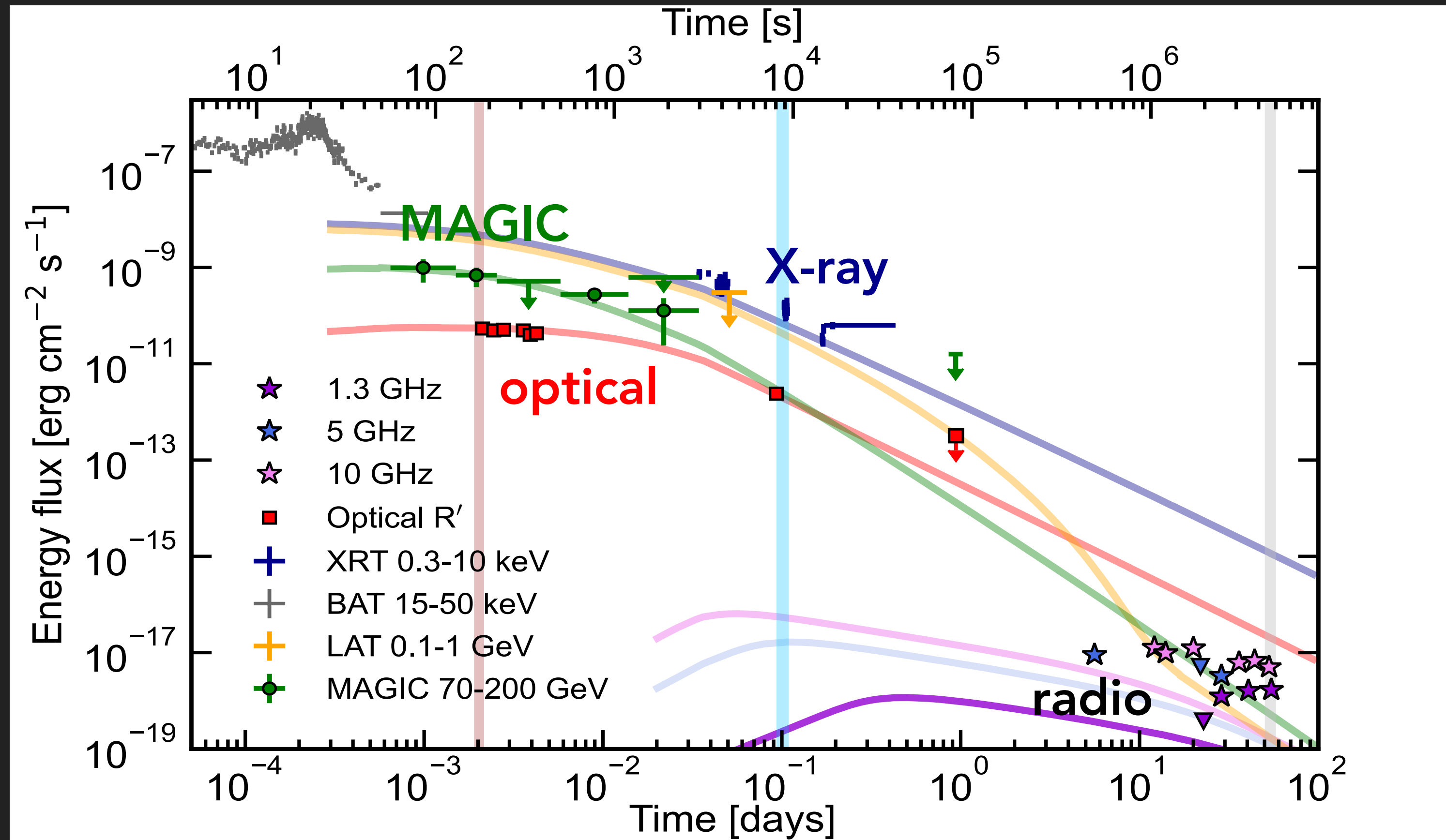
- ▶ IGMF (talks on Thursday by Paolo Da Vela and Francesco Longo)
- ▶ ALPs (see talk on Monday by Giorgio Galanti)
- ▶ EBL

DOUBLE COMPONENT IN AFTERGLOW SED?



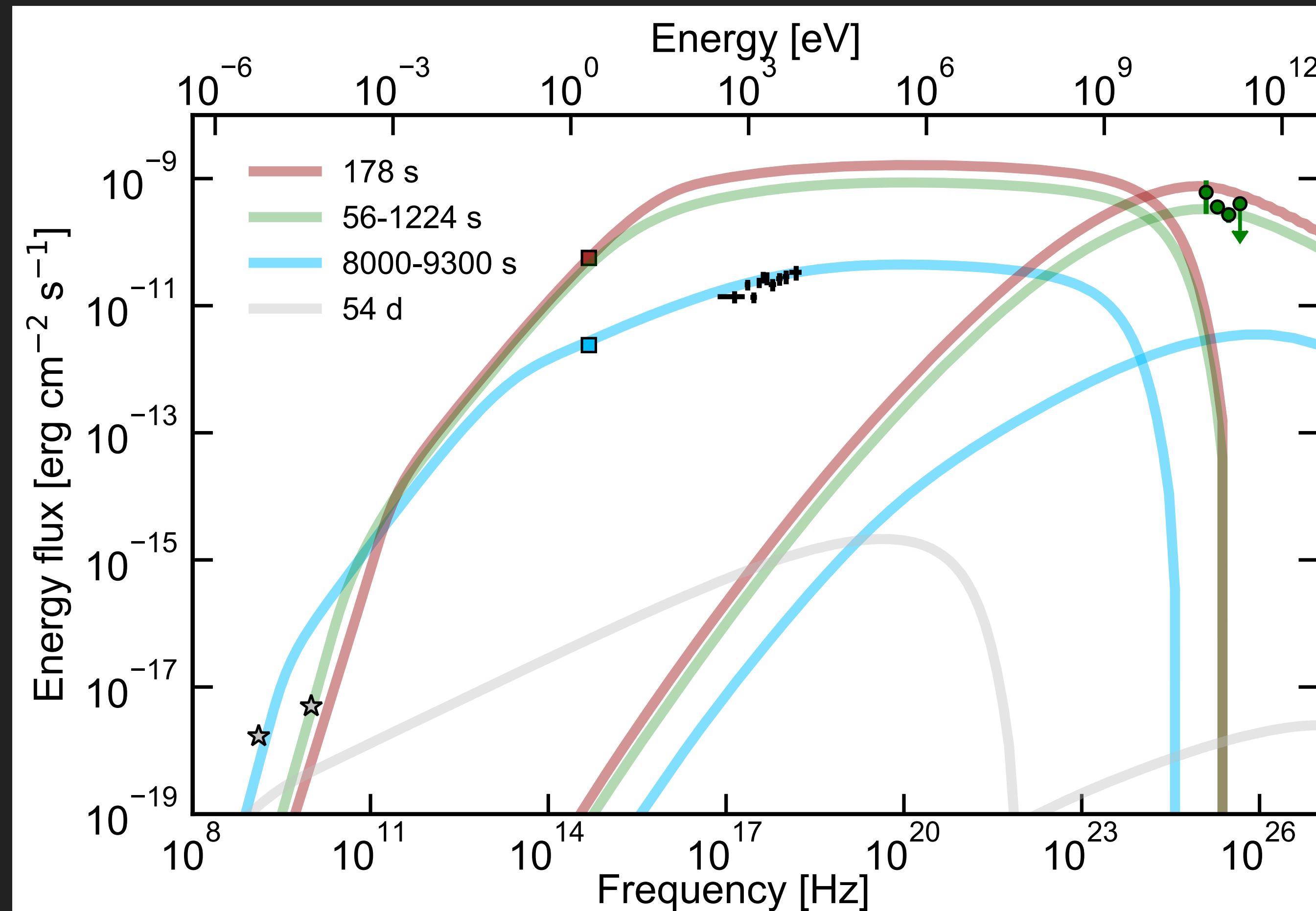
201216C (MAGIC, $Z=1.1$)

MAGIC collabor., 2024, MNRAS, 527, 5856



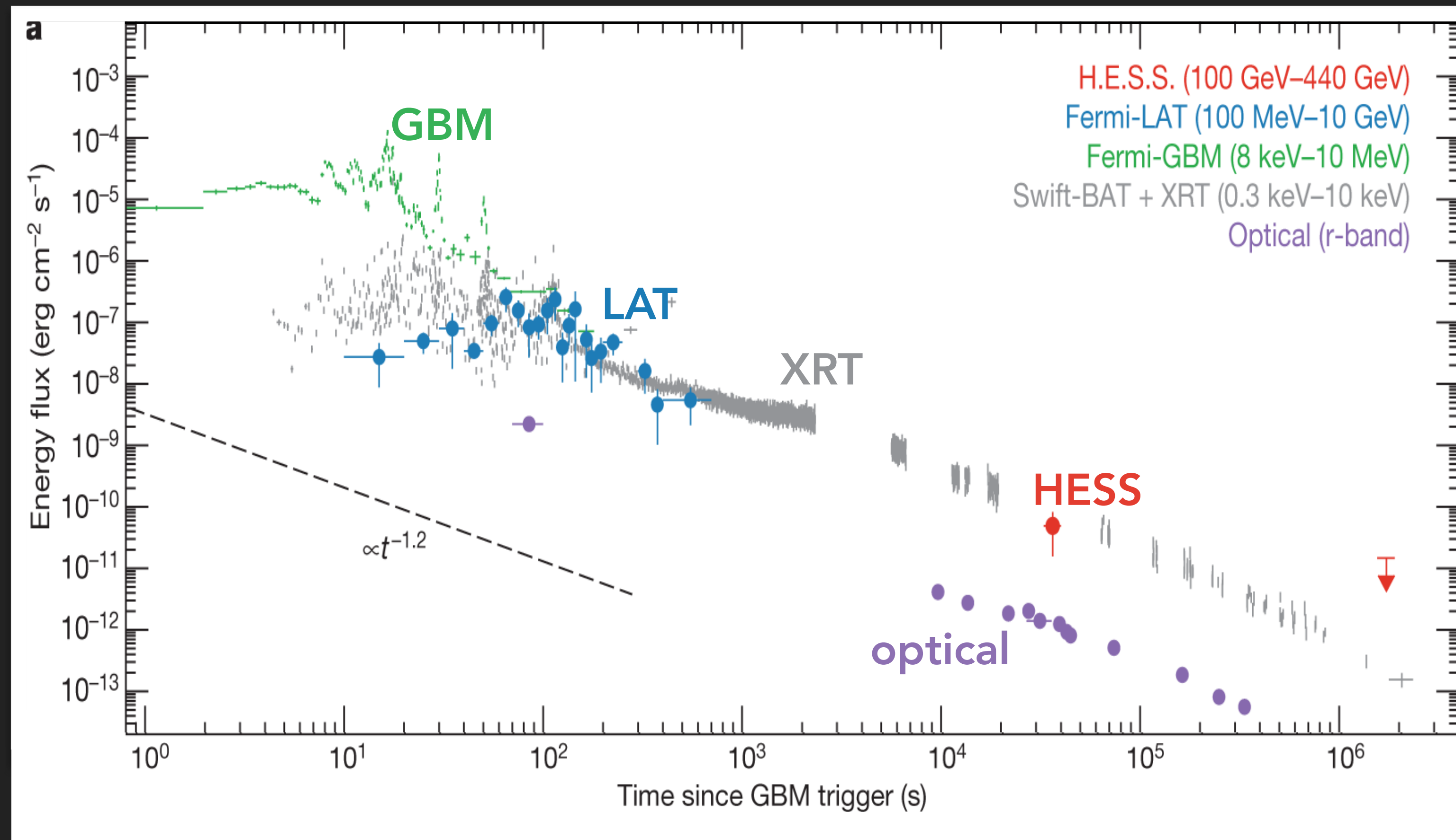
201216C (MAGIC, $Z=1.1$)

MAGIC collabor., 2024, MNRAS, 527, 5856



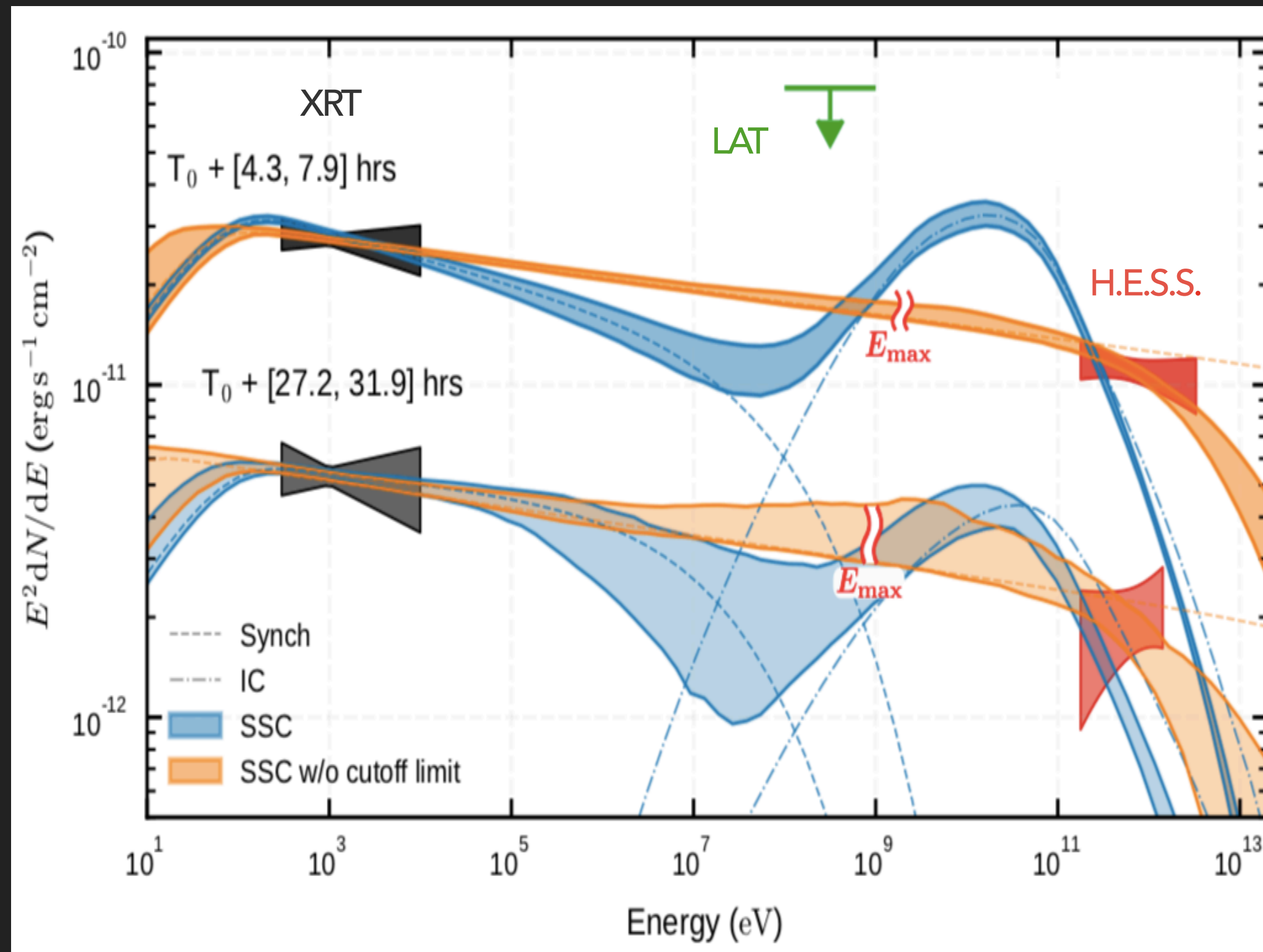
180720B (HESS, $Z=0.65$)

H.E.S.S. Collab, 2019, Nature, 575, 464



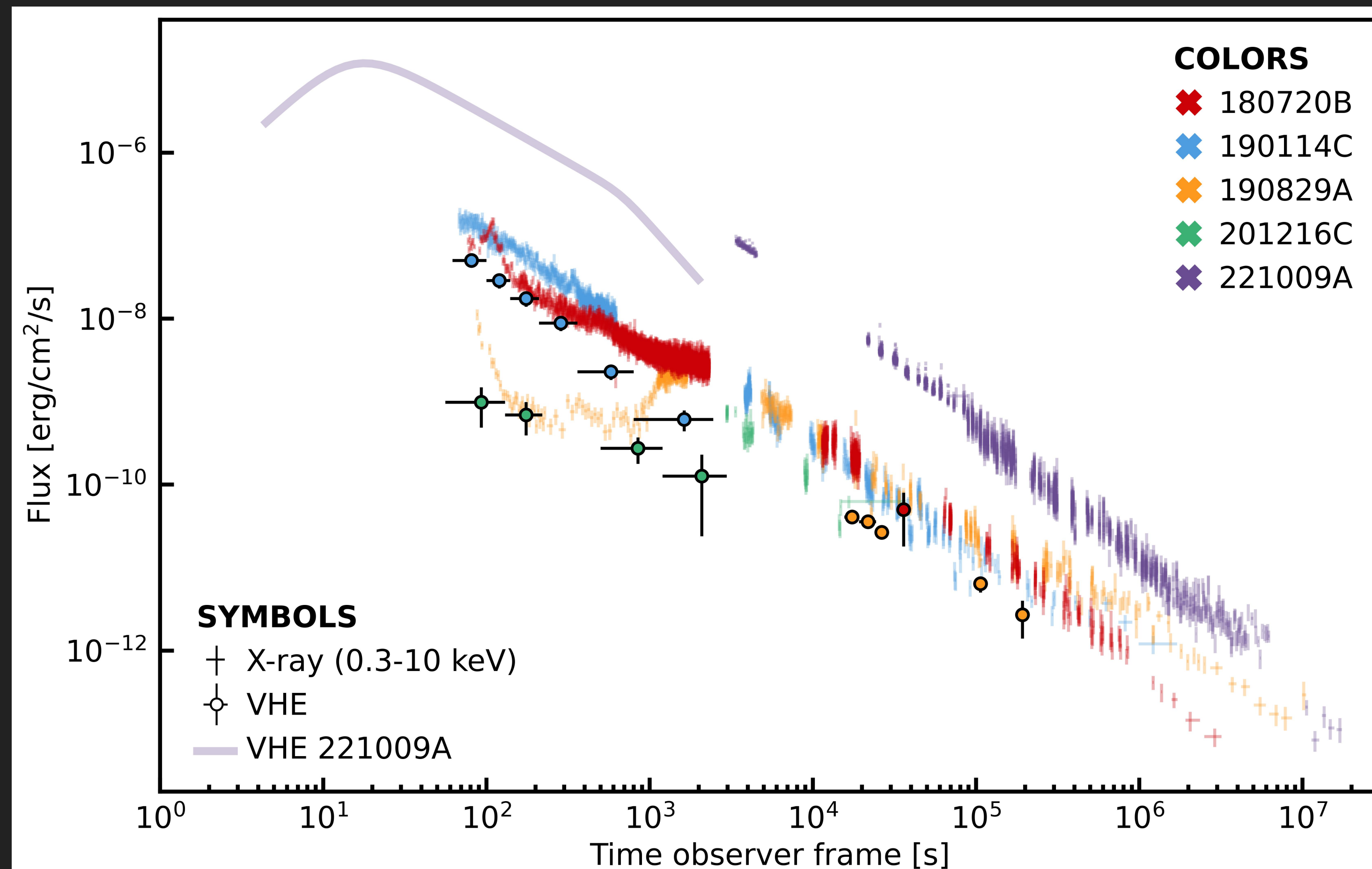
190829A (HESS, $Z=0.078$)

HESS Collab, 2021, Science 372, 1081



X-RAY AND TEV FLUX LIGHT CURVES

adapted from Miceli D. & Nava L., 2022, Galaxies, 10, 66



X-RAY AND TEV LUMINOSITY LIGHT CURVES

adapted from Miceli D. & Nava L., 2022, *Galaxies*, 10, 66

