

The BOAT that rocked: the radio afterglow of GRB 221009A

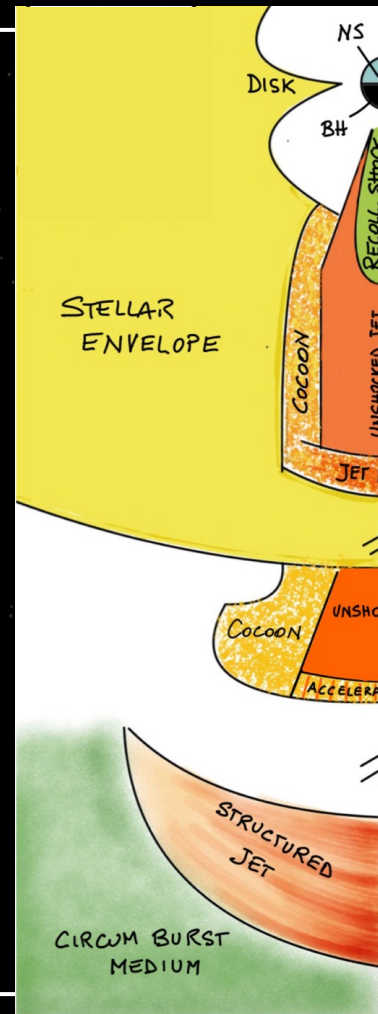
Lauren Rhodes

on behalf of Alexander J. van der Horst, Stefano Giarratana, Joe S. Bright, James K. Leung, Gemma E. Anderson, Rob Fender and many more

lauren.rhodes@mcgill.ca

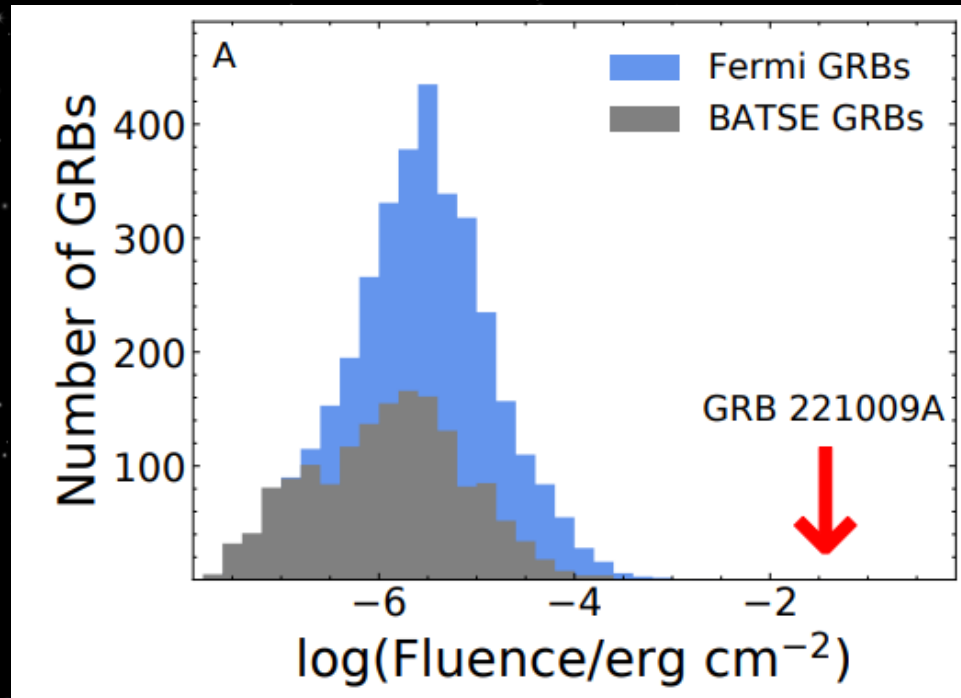
GRB jets – an intro

- GRB jets are launched through the progenitor stellar envelope
- Complex structure is expected
- Multiple emitting components are expected



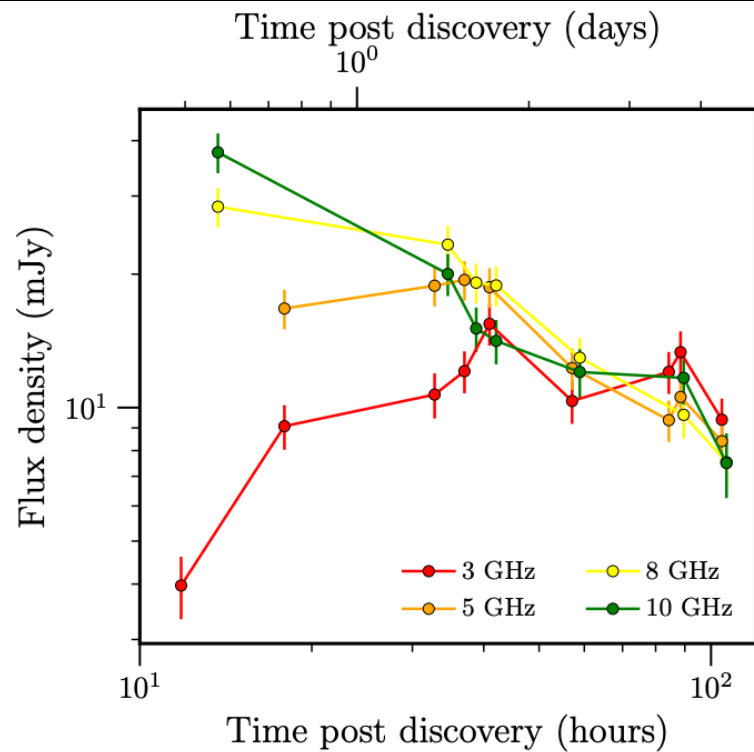
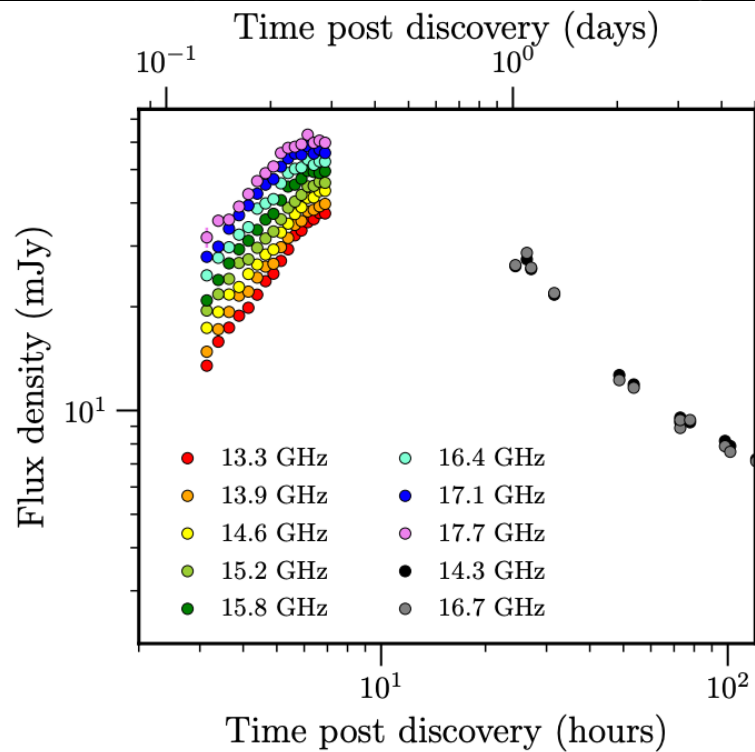
GRB 221009A

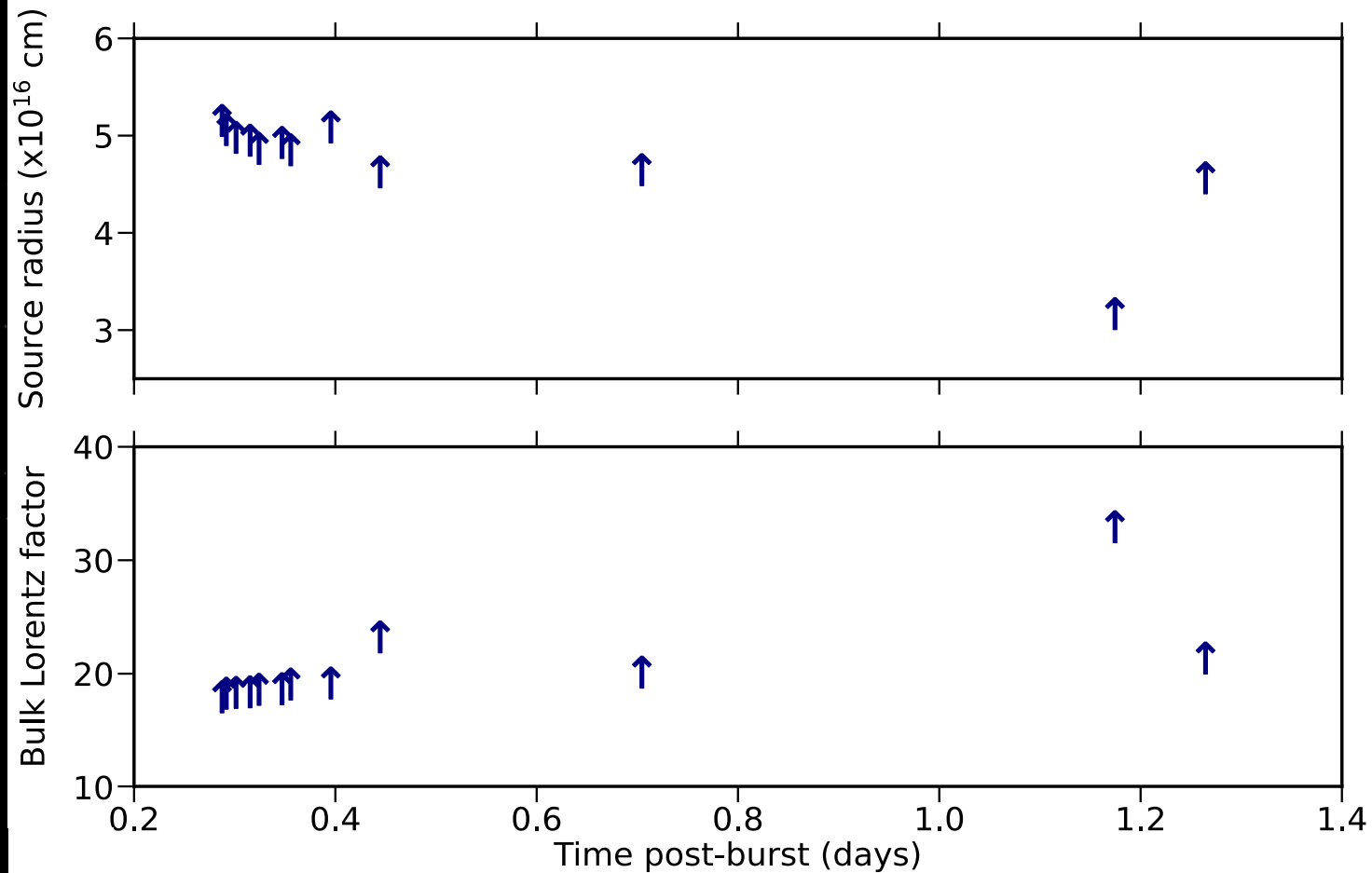
- 9th October 2022
- $z = 0.151$
- Detected at $\sim 7\text{TeV}$
- "Brightest of all time"



The first 5 days...

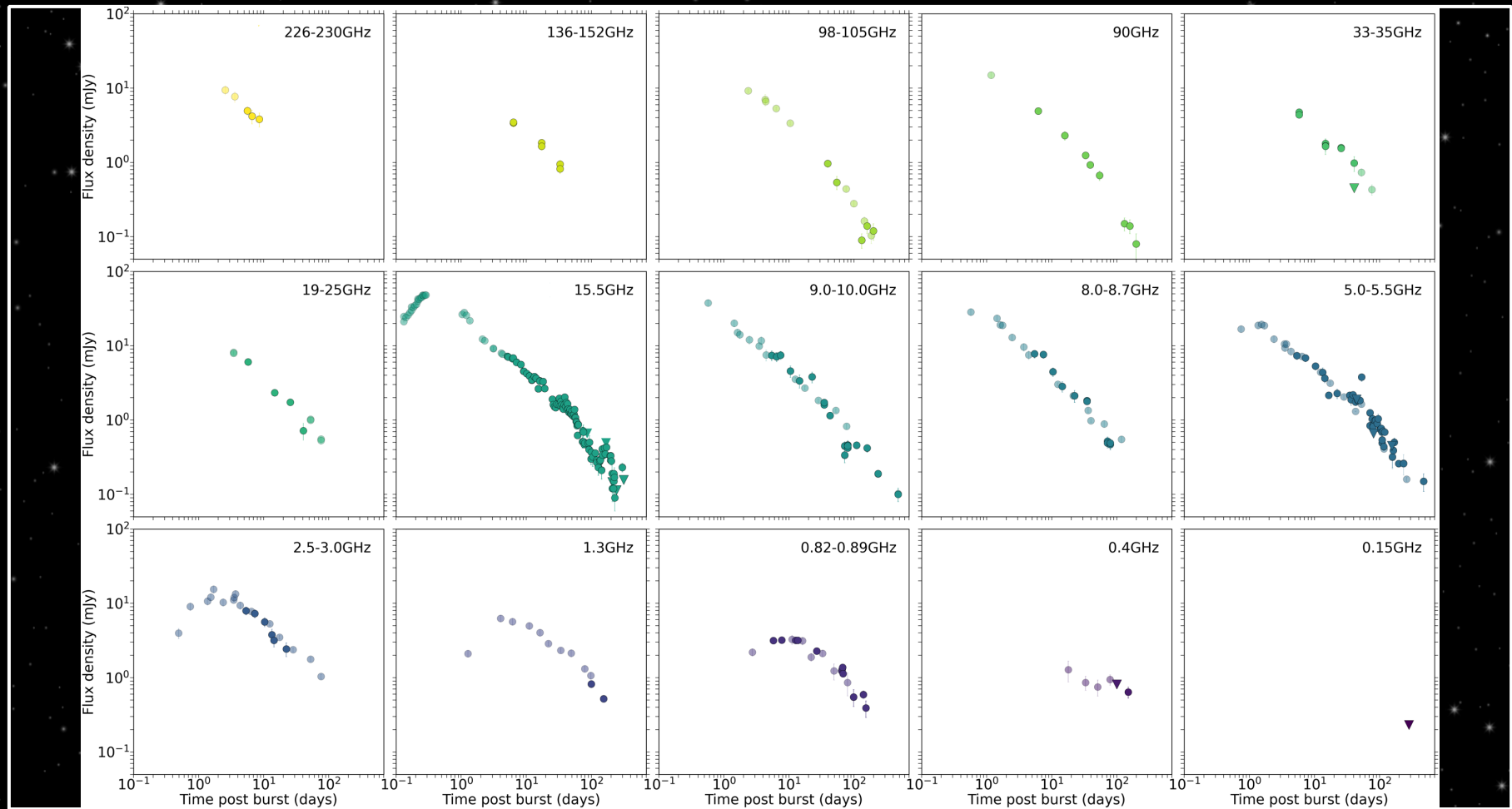


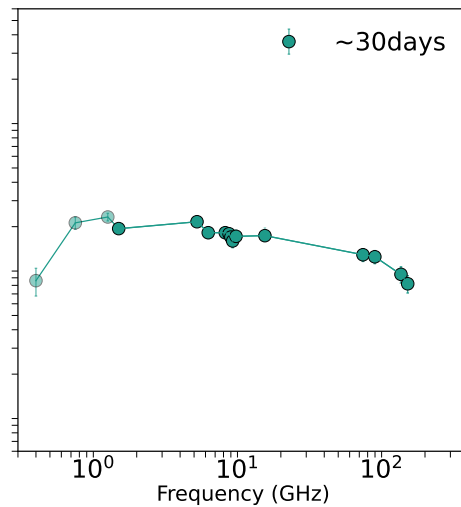
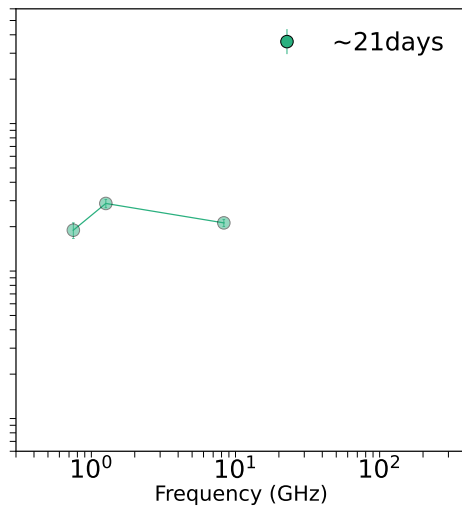
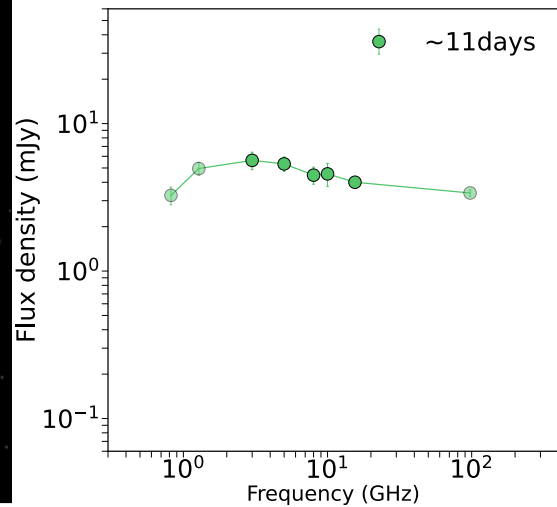
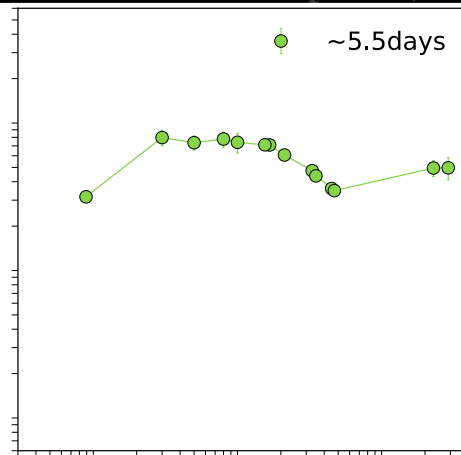
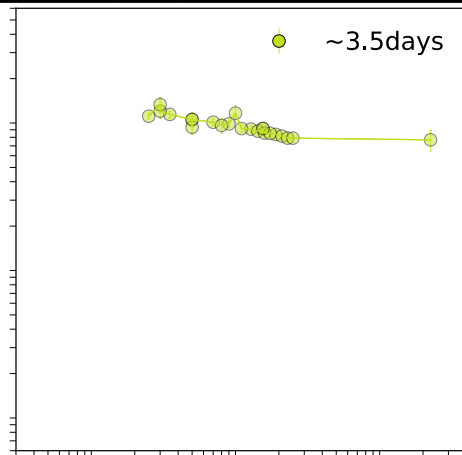
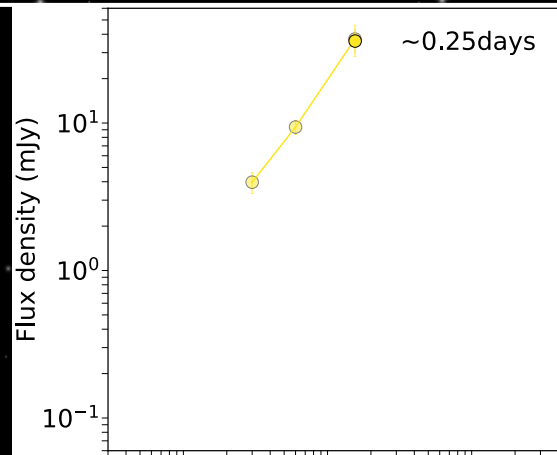




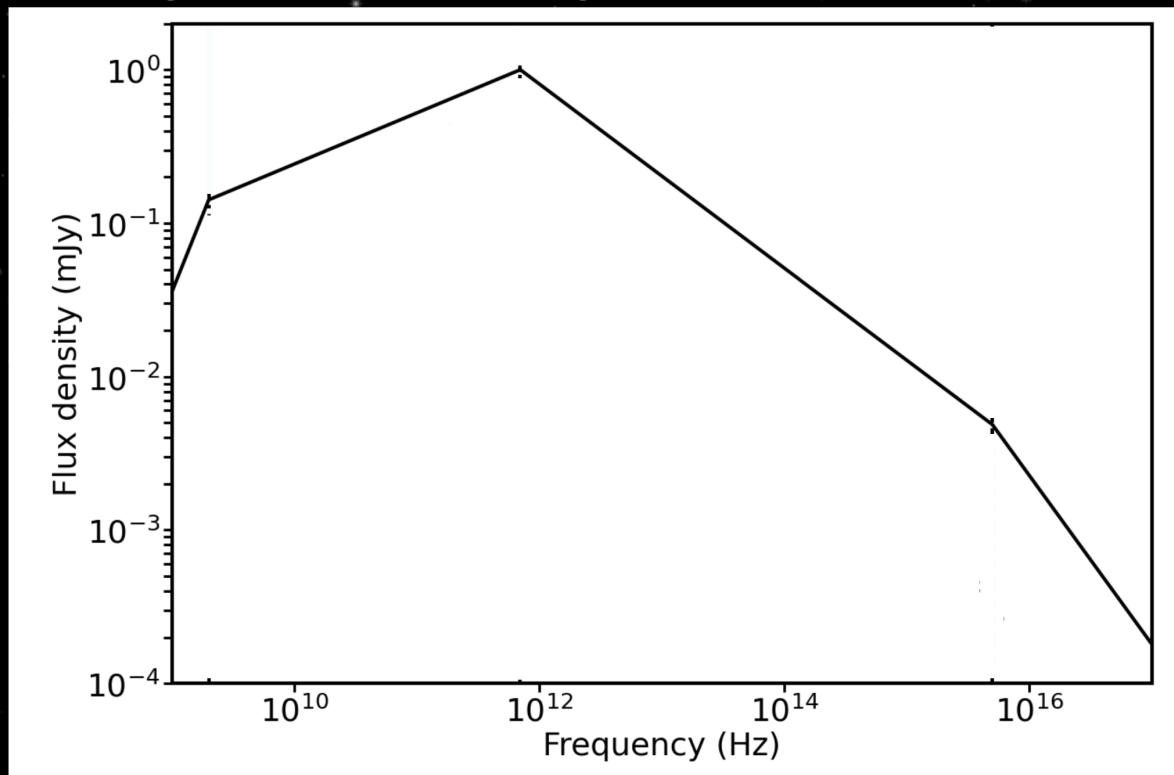
The next 470 days...



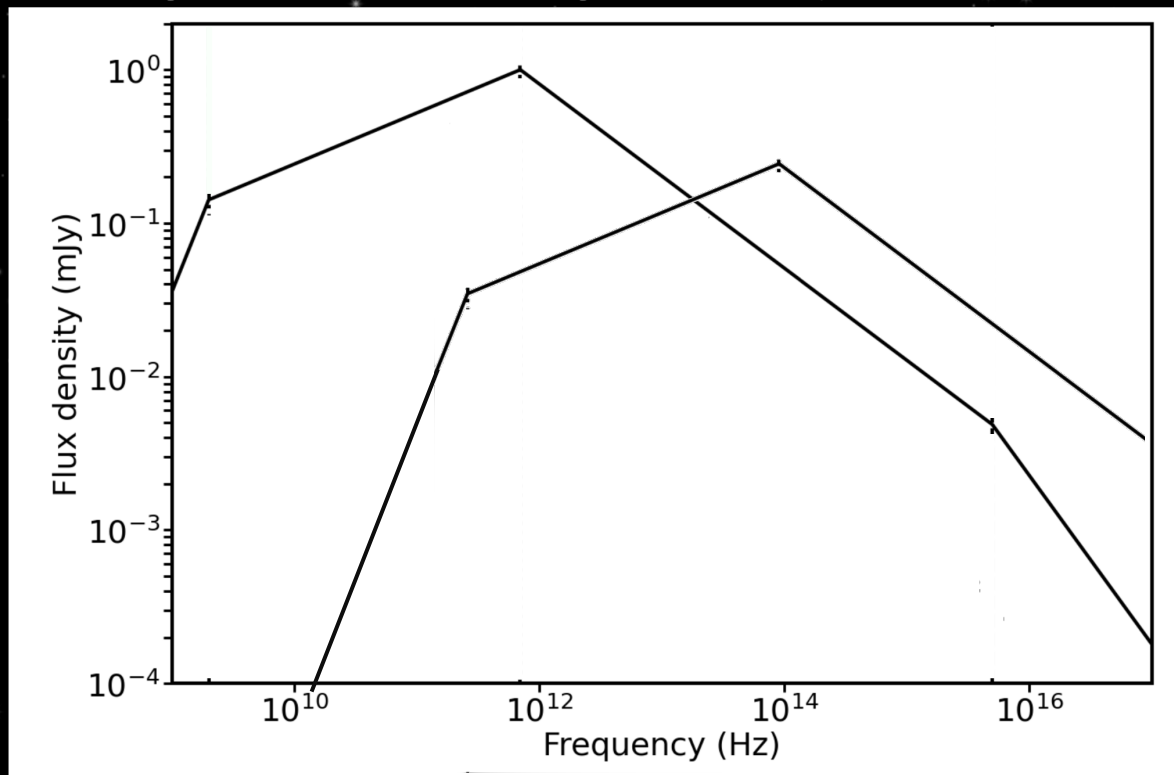




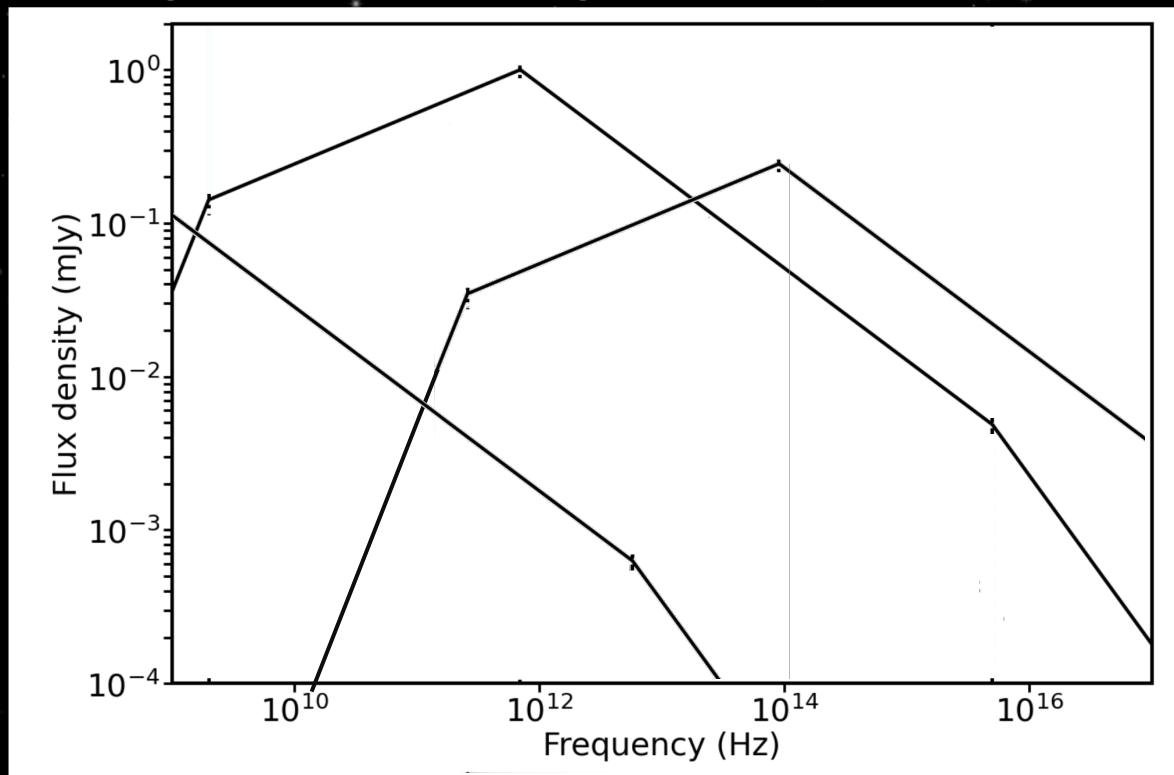
Modelling the afterglow of GRB 221009A



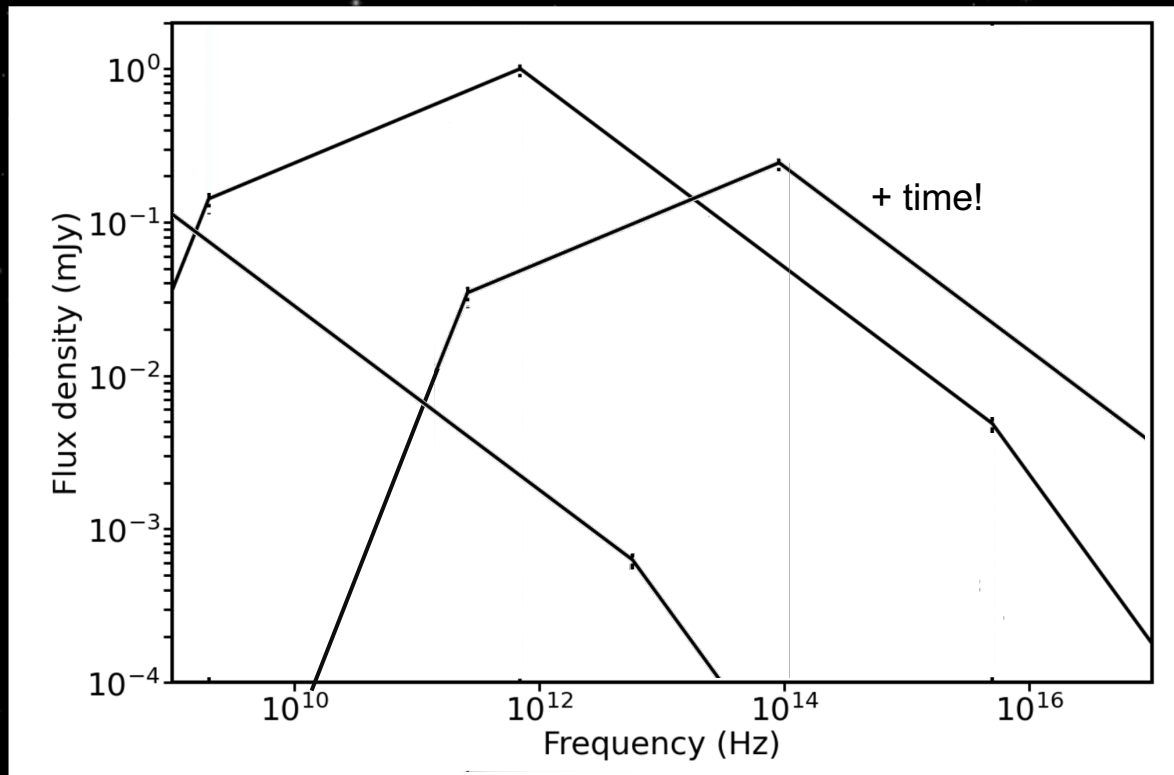
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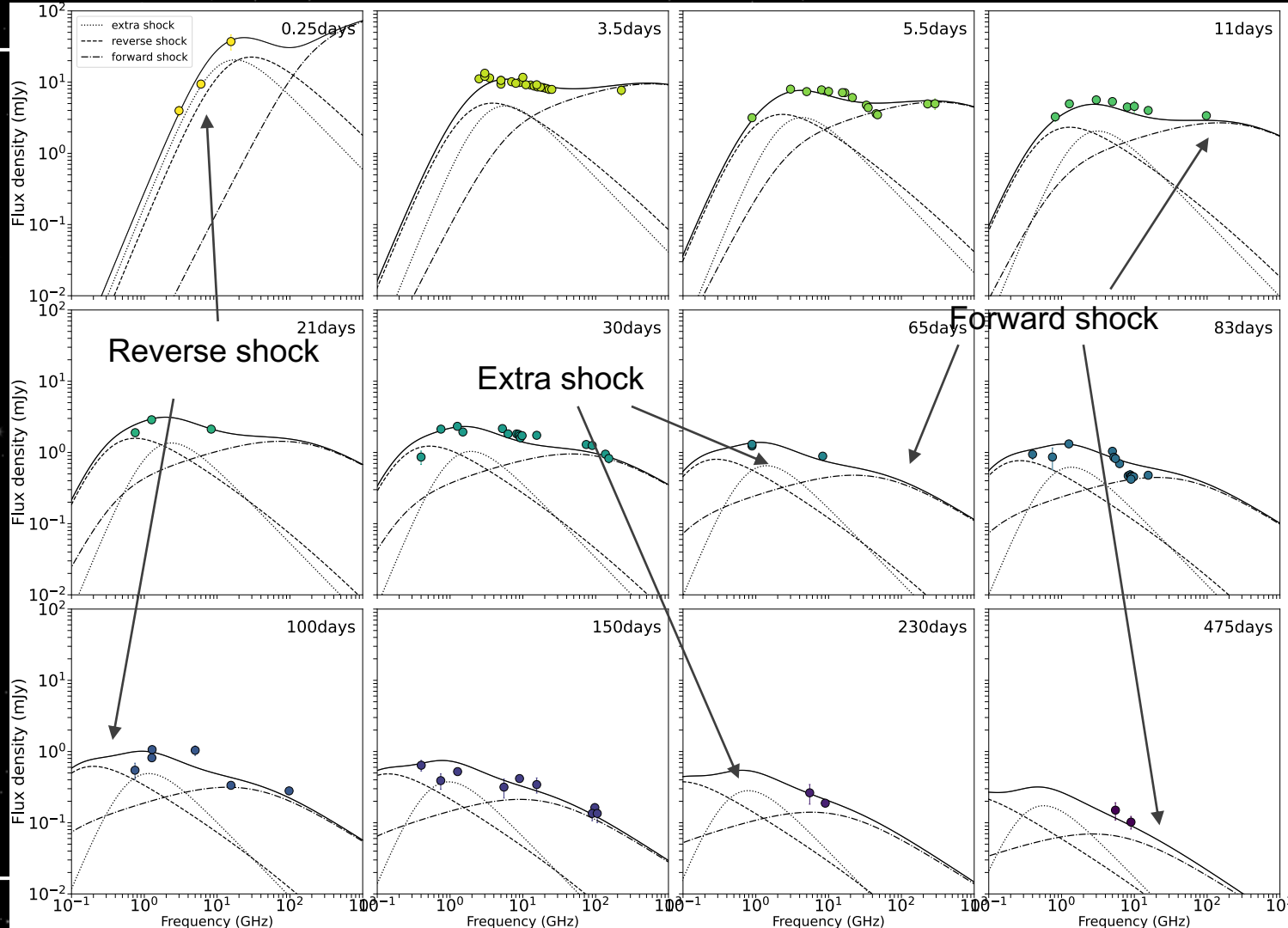


Modelling the afterglow of GRB 221009A



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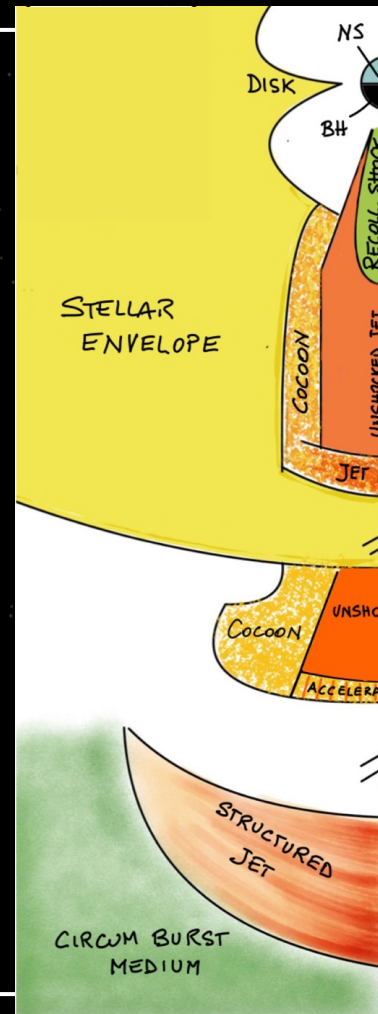




Open questions:

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- How does the forward shock match compare to theory?

$$p = 2.32$$

$$F_{v,max} \propto t^{-0.97}$$

$$v_{SA} \propto t^{-1.4}$$

$$v_m \propto t^{-1.06}$$

Open questions:

- What is the extra shock?
- How does the forward shock match compare to theory?
- Where is the jet break?

Conclusions

The screenshot shows a GitHub repository interface for a project named 'BOAT'. The repository is marked as 'Private' and is a fork of 'InterPlanetaryNetwork/BOAT'. At the top, there are buttons for 'Watch' (0), 'Fork' (0), and 'Star' (0). Below this, the repository navigation bar includes 'main' branch, '2 Branches', '0 Tags', a search bar 'Go to file', and buttons for 'Add file' and '<> Code'. A status bar indicates 'This branch is 9 commits behind InterPlanetaryNetwork/BOAT:main' with 'Contribute' and 'Sync fork' buttons. The repository owner 'LaurenRhodes' is listed with 'Add files via upload', a commit hash '1cd7b67', and '74 Commits'. A file list shows 'lighthouse' (Added version.py, last year) and 'support_data_and_code' (Add files via upload, last year). On the right, the 'About' section is titled 'Full dataset behind the BOAT' and lists 'Readme', 'Activity', '0 stars', '0 watching', and '0 forks'.

BOAT Private

forked from [InterPlanetaryNetwork/BOAT](#)

main 2 Branches 0 Tags

Go to file

Add file

<> Code

About

This branch is 9 commits behind [InterPlanetaryNetwork/BOAT:main](#)

Contribute Sync fork

LaurenRhodes Add files via upload 1cd7b67 · last year 74 Commits

lighthouse	Added version.py	last year
support_data_and_code	Add files via upload	last year

About

Full dataset behind the BOAT

- Readme
- Activity
- 0 stars
- 0 watching
- 0 forks

Thank you, any questions?