Onsala Space Observatory

Observational support unit

Daniel Tafoya

Poster #360

Onsala Space Observatory

Daniel Tafoya, on behalf of the Observational Support Unit

The observational support unit at the Onsala Space Observatory provides a wide variety of support and services to astronomers, foremost in the Nordic countries, in order to facilitate their use of world leading radio astronomy telescopes in their research.

sweSRC

The Sweden SKA Regional Centre primary goal is to develop and deploy Sweden's share of inter-connected data storage and compute resources to the global SRCNet project which will provide the data archive and second tier processing layer for SKA data delivery to its users.

Nordic ARC node

The mission of the Nordic ARC node is to provide full user support for ALMA users in the Nordic and Baltic countries, from proposal development and submission, to data reduction and analysis. The ultimate goals are to help and encourage the community to make the best use of ALMA. ARC node services include e.g. face-to-face support for proposal preparation, observing setups, projects status follow-up, data reduction (CASA software), and access to archives.

VLBI

The Onsala Space Observatory operates the 20 m and 25 m radio telescopes for a broad range of radio astronomy and VLBI observations. The telescopes are primarily used for millimeter/centimeter-wave VLBI. The observatory provides user support by carrying out observations for the scientific community and supporting telescope operations and observing programs.

LOFAR

The Swedish LOFAR station is located at Onsala Space Observatory and is one of 14 international LOFAR stations distributed across Europe. Onsala contributes to LOFAR scientific operations by supporting observations, maintaining station activities, and assisting the user community in the execution of observing programs.

CIORA

The Onsala Space Observatory provides computing and storage resources through the Compute Infrastructure at Onsala for Radio Astronomy (CIORA), supporting research in radio and mm/submm astronomy, including ALMA, VLBI, LOFAR, SKA pathfinders, and other interferometric observations. The infrastructure offers virtual machines with customizable CPU, RAM, storage, and GPU resources, together with user support for project applications, software environments, and data management for the scientific community.

LOFAR 10-240MHz

20m telescope
2-115GHz

25m telescope
1-7GHz

The Nordic ARC node support for ALMA users

Sabine König, Daniel Tafoya, Sebastien Muller, Simon Casey, Franz Kirsten

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ALMA

The Nordic ARC node

User support

Expertise

An Overview of the Astronomical Facilities of the Canary Islands

J. Martikainen[1,2], O. Zamora[1], and J.A. Acosta-Pulido[1]
[1]Instituto de Astrofísica de Canarias, 38200 La Laguna, Tenerife, Spain
[2]Nordic Optical Telescope, 38711 Breña Baja, La Palma, Spain

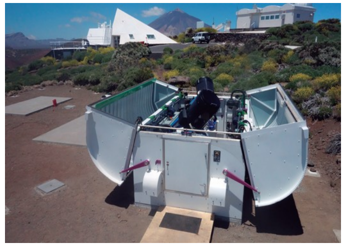
SITES

Roque de Los Muchachos Observatory (La Palma)

and Teide Observatory (Tenerife)

FACILITIES

Optical · Infrared · Solar · Robotic · Survey

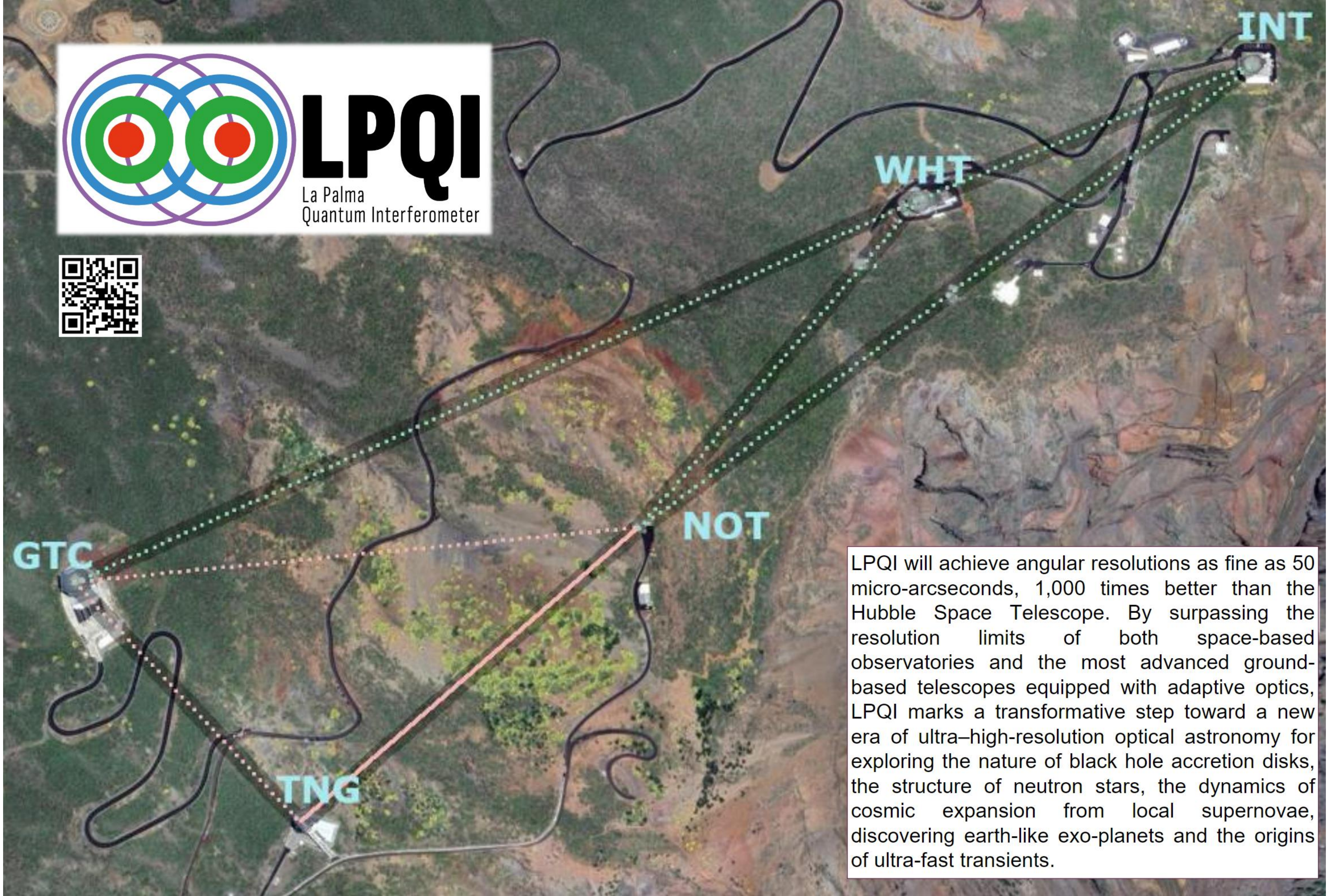


SCIENCE

Transients · Exoplanets
Stars · Galaxies
Solar System · Solar physics
High-energy physics

LPQI

La Palma Quantum Interferometer

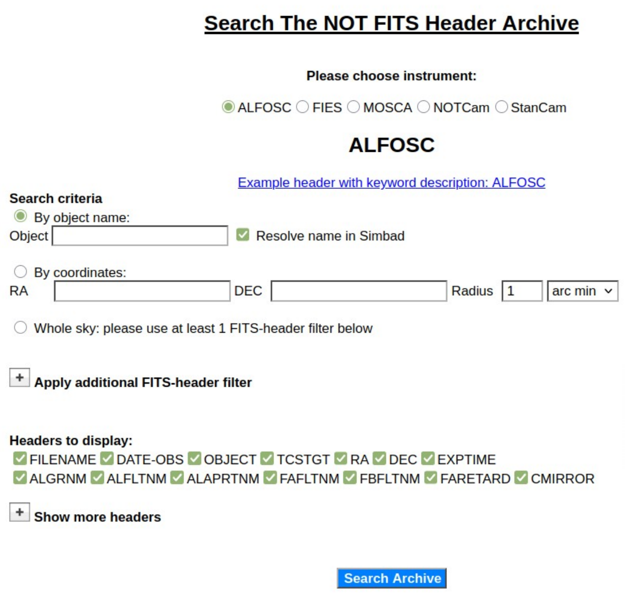


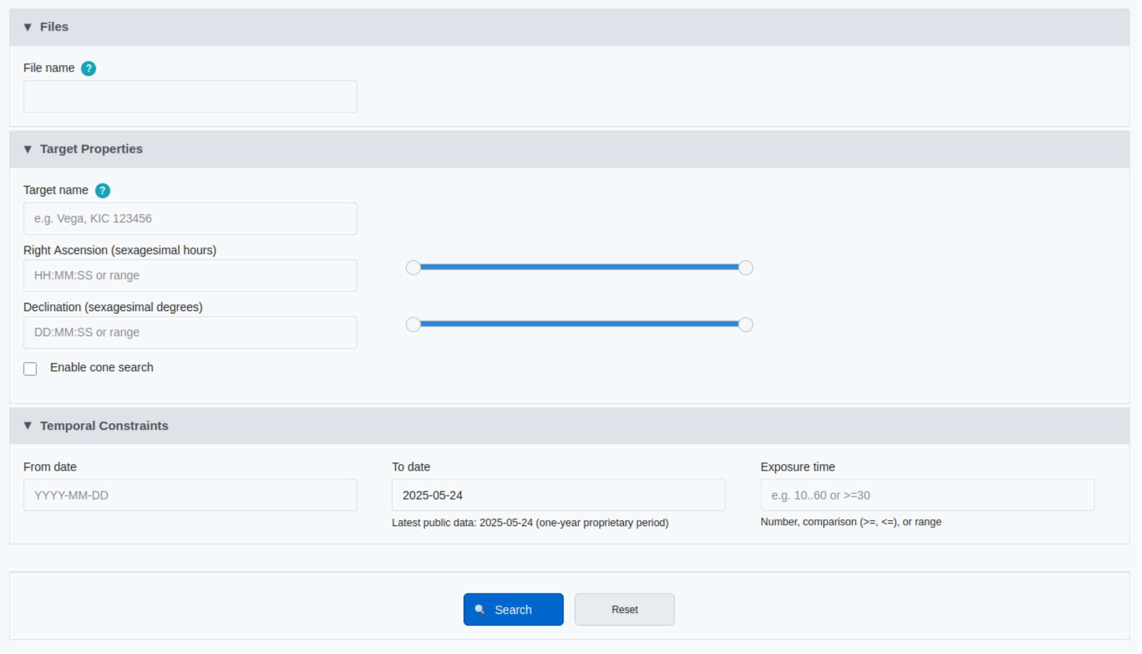
LPQI will achieve angular resolutions as fine as 50 micro-arcseconds, 1,000 times better than the Hubble Space Telescope. By surpassing the resolution limits of both space-based observatories and the most advanced ground-based telescopes equipped with adaptive optics, LPQI marks a transformative step toward a new era of ultra–high-resolution optical astronomy for exploring the nature of black hole accretion disks, the structure of neutron stars, the dynamics of cosmic expansion from local supernovae, discovering earth-like exo-planets and the origins of ultra-fast transients.

From Archive to Discovery:

Enabling New Science with the NOT Data Archive

P. M. Sagredo Torres [1,2], P. M. Sørensen [1,2], H. Kjeldsen [2], S. Armas Pérez [1,2], M. S. Fredslund [2], C. M. Moreno Saldaña [1,2], J. L. Rørsted [2]





Nordic-Baltic Astronomy Days
Turku, Finland
May 26-29, 2026

New and upgraded observing facilities at Tartu Observatory

UNIVERSITY OF TARTU
Tartu Observatory
1632

1.5 meter telescope AZT-12

The fibre-fed spectrograph TOFES

R=33000, limiting magnitude 10

The CCD-photometer with 12 filters (Johnson-Cousins and SDSS, Hα, …)

We are open for collaboration

A new method for observationally constraining cosmic ray diffusion in nearby galaxies

Alice Knutas, Georgia Panopoulou, Sam Ponnada, Cathy Horellou, Philip Hopkins.

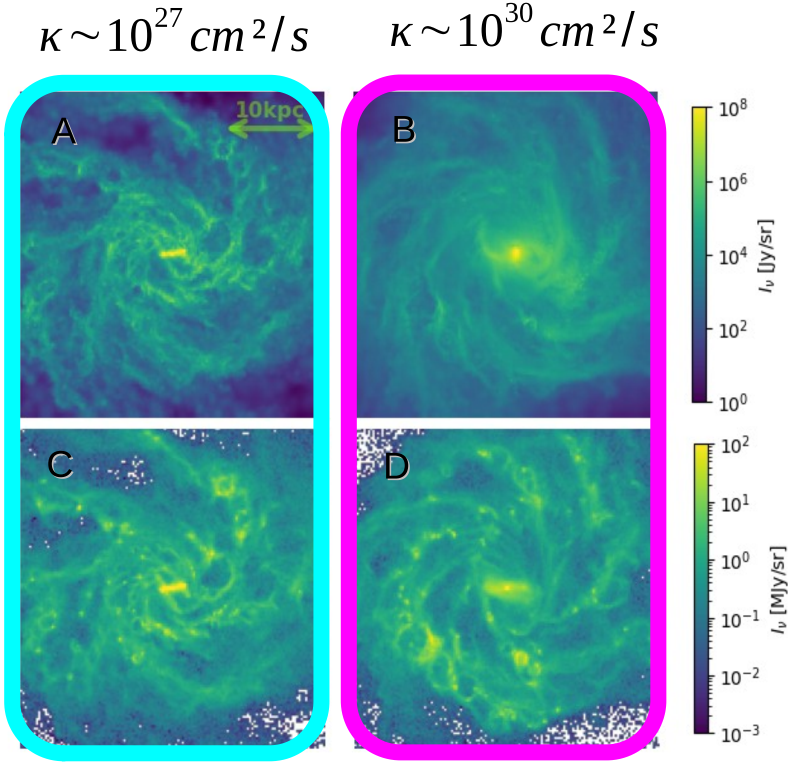


Figure 1: Synthetic observations in radio 21cm (panels A,B) and IR at 500μm (panels B,C) for low (A,C) and high (B,D) diffusion coefficient.

The effect of the cosmic rays in galaxies depend on their diffusion in the ISM, quantified by a diffusion coefficient (κ).

The idea is to compare galaxy morphology in radio and IR and study,

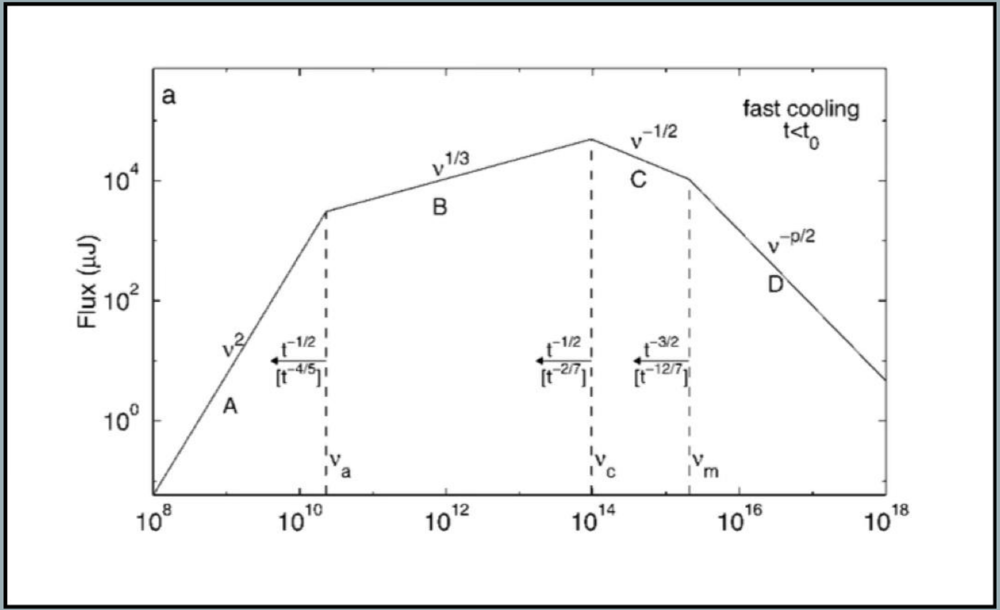
1. Does varied cosmic rays diffusion affect the radio morphology of a galaxy?
2. How can we quantify morphological similarity?
3. Can morphological similarity distinguish between different diffusion coefficient models?

FAST-COOLING SYNCHROTRON PROMPT EMISSION FROM INTERNAL SHOCKS IN GRB 241030A

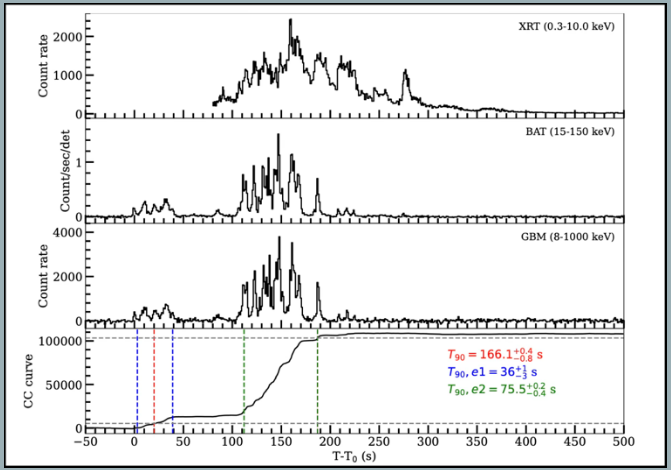
Varun (vvarun@kth.se), Bin-Bin Zhang, Xiao-Hong Zhao, Jun Yang, Runchao Chen, and Vikas Chand

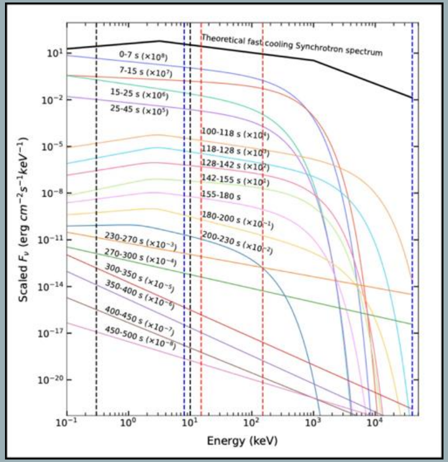
Synchrotron Radiation in relativistic Shocks:

$$F_\nu = \begin{cases} (\nu/\nu_c)^{1/3} F_{\nu,\max}, & \nu_c > \nu, \\ (\nu/\nu_c)^{-1/2} F_{\nu,\max}, & \nu_m > \nu > \nu_c, \\ (\nu_m/\nu_c)^{-1/2} (\nu/\nu_m)^{-p/2} F_{\nu,\max}, & \nu > \nu_m, \end{cases}$$



GRB 241030A :





Magnetically dominated outflows with decaying field :

$$\nu_m \simeq \frac{3 q_e}{4 \pi m_e c} \Gamma B_{\rm eff} \gamma_m^2$$

$$\nu_c \propto \Gamma B_{\rm eff}^{-3} (\Delta t')^{-2}$$

Does not match with observations

Matter dominated Internal shock scenario:

$$\gamma_{\rm rel} \approx \frac{1}{2}\left(\frac{\gamma_f}{\gamma_s} + \frac{\gamma_s}{\gamma_f}\right)$$

$$\nu_m \propto B' \gamma_m^2 \propto R^{-1} (\gamma_{\rm rel} - 1)^{5/2} \gamma_{\rm rel}^{1/2} (\epsilon_e/\xi)^2 \epsilon_B^{1/2}$$

$$\nu_c \propto \left(B'^3 \delta t^2\right)^{-1} \propto R^3 \delta t^{-2} [(\gamma_{\rm rel} - 1)\gamma_{\rm rel}]^{-3/2} \epsilon_B^{-3/2}$$

Matches with the observational trend