## Seventeenth Marcel Grossmann Meeting



Contribution ID: 341

Type: Talk in a parallel session

## On the probing of non-homogeneous magnetic fields in radio supernovae

Thursday, 11 July 2024 17:40 (20 minutes)

Observations and numerical simulations indicate that non-homogeneous magnetic fields are ubiquitous in astrophysical settings. However, in most models of astrophysical non-thermal radiation they are not treated as non-homogeneous. Here we present our analysis of non-homogeneous magnetic field of radio supernovae. Flat topped radio spectra around synchrotron self-absorption frequency points to a non-singular value of magnetic field. Building upon that, we present a numerical scheme to solve the integral equation related to synchron self-absorption using two different inverse methods present in scipy Python library: LSMR (an iterative method) and NNLS (non-negative least square). We present the limitations of LSMR as a method which works well only with smooth magnetic field distribution functions, while NNLS works well only in the cases of the singular or discrete magnetic field value. We open the discussion about the influence of non-homogeneous magnetic fields on the radiation spectra of other known astrophysical phenomena.

Primary author: KARLICA, Mile (ICRANet)

**Co-authors:** Prof. BJÖRNSSON, Claes Ingvar (Stockholm University); Prof. VUKČEVIĆ, Miroslava (Astronomical Observatory of Belgrade); MORADI, Rahim (ICRANet and ICRA-Sapienza)

Presenter: KARLICA, Mile (ICRANet)

Session Classification: High energy astrophysics

Track Classification: High energy (HE): High energy astrophysics