



Contribution ID: 28

Type: **not specified**

Studying the afterglow phase of Gamma-Ray Bursts in radio

Thursday, 30 November 2023 15:20 (25 minutes)

Some massive stars end their lives with a catastrophic explosion which leaves behind a spinning, stellar mass black hole or a highly magnetised neutron star. Regardless of the nature of the remnant, this central engine launches two jets of ionised matter which eventually interact with the circum-burst medium through external shocks, producing the so called Gamma-Ray Burst (GRB) afterglow, which can be detected from the very-high energy throughout the whole electromagnetic spectrum. Radio observations, and in particular VLBI, are fundamental to measure the apparent superluminal expansion (on-axis GRB) and proper motion (off-axis GRB) of the GRB outflow, to constrain its structure and to characterise the circum-burst medium. In this talk I will present two representative cases for radio studies of GRBs: GRB201015A and GRB221009A. For the former, interferometric observations were crucial to characterise the density profile of the circum-burst medium; on the other hand, VLBI observations of the brightest GRB of all time, GRB221009A, allow us to constrain the expansion and the proper motion of the centroid. These cases are the tip of the iceberg of a population that can be easily studied with the sensitivity, the angular resolution and the surveying capabilities of the SKA. Finally, I will discuss the impact of SKA on long GRB science.

Research area

Transients

Primary author: GIARRATANA, Stefano (Istituto Nazionale di Astrofisica (INAF))

Co-author: GIROLETTI, Marcello (Istituto Nazionale di Astrofisica (INAF))

Presenter: GIARRATANA, Stefano (Istituto Nazionale di Astrofisica (INAF))

Session Classification: Parallel - Transients, Pulsars, GW