



Dimakatso Maheso //
University of Johannesburg (UJ)

Session 6 //

Thursday, 7 September @ 12:30 SAST

Short gamma-ray transients (SGRTs) from compact mergers and magnetars are distinct sources with varying temporal and spectral features. Short gamma-ray bursts (SGRBs) originate from compact mergers hence they are cosmological entities whilst magnetar giant flares (MGFs) are short SGRTs from magnetars which originate from nearby star forming galaxies. They are both short lived ($T_{90} < 2$) s and SGRBs typically have one pulse whilst MGFs are multi-peaked consisting of a main peak and fading oscillating pulses. However, at cosmological distances, the fading oscillating phase of MGFs is not observed hence resembling SGRBs. The aim of this study is to make a distinction between the two SGRTs based on their temporal and spectral features using 8 SGRBs and the recent MGF, GRB200415A with known redshift. The temporal analysis shows that the pulse rise times of SGRBs are typically slower whilst the MGF has rapid rise times. Both have hard spectra but the MGF has thermal-like spectra with low energy spectral index, $\alpha \sim 0$ unlike the non-thermal spectra observed in SGRBs. The thermal-like emission and fast-rising pulse in MGFs is likely due to large amount of energy from magnetar surface deposited in a small volume near the surface, resulting in rapid heating of electrons. Slower pulse rise time in SGRBs is likely to be due to emission coming from internal shocks at a larger distance from the central engine.

ADDITIONAL AUTHORS

Initials	Surname	Affiliation
S	Razzaque	UJ