

GRBs: The Reverse Shock Renaissance

Abstract

One of the key unsolved questions in the physics of Gamma-ray bursts (GRBs) is the nature of their jets, whether baryonic or magnetically dominated. Reverse shock signatures (which indicate baryonic outflows) are expected to be the key discriminating factor. Locating and tracking this emission component, which peaks in the mm and cm-bands, further yields the initial Lorentz factor and jet magnetization, providing critical clues to the nature of the ejecta and central engine. In this MeerKAT program, we propose to exploit the southern-hemisphere synergy between ATCA, ALMA, and MeerKAT to search for reverse shock emission in GRBs, and to explore the physical conditions under which these signatures are produced.