[5] Elabidi, H., Ben Nessib, N. and Sahal-Bréchot, S.: 2004, *J. Phys. B: Atom. Mol. Opt. Phys.*, **37**, 63.
[6] Elabidi, H. et al.: 2008, *J. Phys. B: Atom. Mol. Opt. Phys.*, **41**, n 025702.

PHYSICAL PARAMETERS OF THE RELATIVISTIC SHOCK WAVES IN A SAMPLE OF GRBs WITH MULTI-PEAKED LIGHT-CURVES

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The Gamma Ray Bursts (GRB) are sudden, elusive phenomena. The current interpretation of these events involves a fraction of the huge amount of gravitational energy associated with the formation of compact objects. This energy is deposited as kinetic energy of thin shells of material in a relativistic collimated outflow. The interactions among these shells and the presence of shocks yield to the GRB prompt emission. Despite this acknowledged sketch of the so called Internal Shock model, even after decades we still do not know much about the physical characteristic of these phenomena. In this work we develop a modified phenomenological model that reproduce the physical situation during the prompt γ-ray emission in a catch-up scenario (Simić & Popović, 2012) and we apply it to fit a sample of GRBs with multi-peaked light-curves. From the fitting procedure then we can extract basic parameters of the relativistic shock waves and look for various correlations among them, in order to give more detailed sight behind the GRB events.