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A possible connection of blueshifts in the Lemaitre - Tolman and Szekeres models with the gamma-ray bursts

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As known since 1980, some light rays emitted from the Big Bang (BB) in a Lemaitre - Tolman (L-T) model reach all observers with an infinite blueshift. This happens when at the emission point the BB function $t_B(r)$ has nonzero derivative and the ray propagates radially. Some authors portrayed the existence of blueshifts as a disaster disqualifying the L-T models. This author recently proposed that blueshifted rays are actually observed as gamma-ray bursts (GRBs). Two papers were published. In the first one, it was shown that L-T based models of GRB sources successfully account for the energies of the GRBs, the large distances to them, their multitude, and for the existence of the afterglows. However, these models did not account for the durations of the GRBs and of the afterglows and for their (hypothetical) collimation into narrow jets. In the second paper, the existence and properties of blueshifts were investigated in exemplary Szekeres models. In them, infinite blueshifts may arise only along two opposite directions, so the collimation is accounted for. The third paper, now submitted for publication, shows how realistic Szekeres-based models of GRBs improve upon the L-T based models. Currently, I work on accounting for the duration of the GRBs and their afterglows, but the work is not yet completed.

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