

## Search for GRB afterglows in the ROSAT all-sky survey

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### Abstract

The recent discovery of long-lasting X-ray afterglow emission from (at least some) gamma-ray burst (GRB) sources has allowed the first identification of these enigmatic objects outside the gamma-ray range. Optical observations of these GRB counterparts suggest a cosmological distance scale. According to the standard scenario, the beaming angle increases with decreasing photon energy (Meszaros & Rees 1997). Though it is yet unclear what fraction of the X-ray emission is part of the GRB itself or indeed the X-ray afterglow produced by the deceleration of the fireball shock wave by the interstellar medium, it is clear that the X-ray afterglow emission should be much less beamed (or not beamed at all) than the GRB emission. This implies that the rate of X-ray (and other long-wavelengths) afterglows should be considerably higher than the GRB rate. A systematic search for afterglows therefore allows to constrain the beaming geometry of GRB emission (Rhoads 1997), in that the ratio of afterglows vs. GRBs determines the geometric beaming factor of the GRB emission.

We report on the status of our search for X-ray afterglows of gamma-ray bursts (GRBs) using the ROSAT all-sky survey (RASS) data. The number of potential X-ray afterglow candidates with respect to the expected number of beamed GRBs allows to constrain the relative beaming angles of GRB emission and afterglow emission at about 1-5 hrs after the GRB.