

Gamma-ray bursts from non-uniform jet and X-ray flashes

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Recently observed X-ray flashes (XRFs) have qualitatively similar properties to Gamma-ray bursts (GRBs) except lower peak energy and flux. It is believed that XRFs can be produced by off-axis GRBs. In addition to homogeneous jet case, we study various properties of non-uniform jets. Both concave and convex profiles of the Lorentz factor are assumed on the gamma-ray emitting surfaces. It is found that the pulse shapes are quite different for both profiles. Viewing angle dependency of the peak energy and flux may be useful to determine the curvature of GRB jet profile.