

Investigation of thermal effects appearing due to gamma-ray heating of circumstellar environment

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The investigation of the influence of gamma-ray emission on relatively dense ($n \sim 10^{13} \text{ cm}^{-3}$) structures in the environment of GRBs ($< 0.1 \text{ pc}$) is presented. Processes of the matter heating under the effect of time-dependent ionization and processes of following plasma cooling are studied. This mechanism can be responsible for the observed irregularities of optical afterglow light curves and X-ray spectral lines.