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Thermalization of the pair plasma and the consequences for Gamma-Ray Bursts GREGORY VERESHCHAGIN, ALEXEY AKSENOV, REMO RUFFINI, ICRA Net and University of Rome “Sapienza” — We consider initial conditions in the sources of Gamma-Ray Bursts. We show that hot and dense pair plasma, created in the source, relaxes to thermal equilibrium configuration with zero chemical potentials well before it starts to expand driven by the radiative pressure. The relaxation process follows the sequence: pairs, protons, photons, thus the first particles reaching the same temperature are electrons and positrons, while photons join the thermal bath latest. We also show that light nuclear elements cannot be synthesized in the fireball.

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