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Chemical Equilibration Involving Decaying Particles in the Early Universe INGA KUZNETSOVA, University of Arizona, TAKESHI KODAMA, IF-UFRJ, Brazil, JOHANN RAFELSKI, University of Arizona — We study kinetic master equations involving chemical reactions comprising the decay of particles in a thermal bath. We consider both, the decay channel into two particles, and the inverse process, the fusion of two thermal particles into one. We derive chemical equilibrium condition for the particle density. We evaluate the thermal invariant rate using as input the free space (vacuum) decay time. We consider examples, how decay time of some hadrons changes in hadronic medium, as compared to vacuum. These considerations are of interest both in heavy ions collisions applications and towards the understanding of hadron evolution in the early Universe. We consider here the reaction $\pi^0 \leftrightarrow \gamma + \gamma$ as one of examples.

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