

## NOTES ON THE PRODUCTION OF MATTER IN THE UNIVERSE

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### S u m m a r y

A model of the production of ordinary and dark matter in the decay of a hypothetical antigravitating medium in the form of a condensate of spinless massive particles, which fills the Universe, is proposed. The decays of these particles into baryons, leptons, and dark matter particles are caused by some interaction with the mass scale between the electroweak interaction and the grand unification. The observed dark energy is identified with a portion of the condensate, which has not decayed up to the instant of a measurement. The decay rate of particles of the condensate is expressed through the three parameters - the coupling constant  $\alpha_X$ , the mass scale  $M_X$ , which defines the mass of an  $X$ -particle as a mediator of the interaction, and the energy imparted to the decay products. Under the assumption that the decay rate of particles of the condensate is of the same order of magnitude as the Hubble expansion rate, the limits of the possible values of the mass  $M_X$  are obtained. The coupling constant  $\alpha_X \sim \frac{1}{70}$  at  $M_X \sim 6 \times 10^{10}$  GeV can be taken as the characteristic value. The cross-sections of the reactions, in which dark matter particles can be produced, are calculated.