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Hypothetical hot primordial regions in the Universe with abnormally high metallicity

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The study of the thermonuclear reaction rates of neutrino production in the primordial hot region is essential for understanding primordial nucleosynthesis in regions formed by primordial density inhomogeneities. We considered the thermonuclear reaction rates due to effects of electron-positron annihilation, reactions of weak proton-neutron transitions, and the production of light nuclides during the early stages of the universe. It is shown that the major neutrino production channel is electron-positron annihilation at higher temperatures, which is dominant in comparison to other thermonuclear reaction rates. However, the reaction rates slow down as the region cools down due to threshold effects, a drop in neutron concentrations, and electron-positron annihilation. Furthermore, a region with an abnormal chemical composition formed.

Primary author(s) : Prof. BELOTSKY , Konstantin (National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Kashirskoe Shosse 31, 115409 Moscow, Russia); Mr. EL-KASMI, Mohamed (National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Kashirskoe Shosse 31, 115409 Moscow, Russia); Prof. RUBIN, Sergey (National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Kashirskoe Shosse 31, 115409 Moscow, Russia)

Presenter(s) : Mr. EL-KASMI, Mohamed (National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Kashirskoe Shosse 31, 115409 Moscow, Russia)

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