

INTISARI

LEPTOGENESIS VIA HAMBURAN DALAM MODEL CERMIN TERMODIFIKASI

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Telah dibangun skenario leptogenesis *via* interaksi hamburan di Model Cermin Termodifikasi (MCT). Skenario ini dibangun untuk membangkitkan asimetri cacah lepton di sektor cermin ($\Delta_{L'}$) dan sektor nyata (Δ_L) di MCT, untuk menghasilkan asimetri cacah barion di masing-masing sektor dan memperkirakan rasio rapat energi materi cermin (Ω_{mc}) dengan rapat energi materi nyata (Ω_{mn}). Dari hasil perhitungan, untuk suhu reheating di sektor cermin ($T_{R'}$) yang besarnya sama dengan di sektor nyata (T_R), $T_{R'}, T_R 10^9$ GeV, tetapi lebih kecil dari skala massa neutrino Majorana singlet ($M 10^{12}$ GeV), $T_{R'} < M$ dan $T_R < M$, diperoleh asimetri cacah barion cermin ($\Delta_{B'}$) dan asimetri cacah barion nyata (Δ_B) di kedua sektor sama besar, $\Delta_{B'} = \Delta_B \cong 10^{-13} - 10^{-10}$, yang berdampak pada rapat energi barion cermin ($\Omega_{B'}$) sama dengan rapat energi barion nyata (Ω_B), $\Omega_{B'} = \Omega_B$. Adapun besarnya rapat energi materi cermin (Ω_{mc}) sekitar 5 kali rapat energi materi nyata ($\Omega_{mn} \sim \Omega_B$), $\Omega_{mc} \simeq 5\Omega_B$. Rapat energi materi cermin terdiri atas 80% rapat energi elektron cermin (Ω_{Ec}) dan sisanya (20%) adalah rapat energi barion cermin, $\Omega_{Emc} = 4\Omega_{B'}$. Rasio rapat energi materi cermin dan rapat energi materi nyata cukup relevan dengan hasil observasi *CMB* yang menyebutkan bahwa rapat energi materi gelap (Ω_{mg}) sekitar 5 kali rapat energi materi tampak (Ω_{mt}) yang didominasi oleh rapat energi barion tampak (Ω_{B_t}), $\Omega_{mg} \simeq 5\Omega_{B_t}$.

Kata-kata kunci: leptogenesis, model cermin termodifikasi, asimetri cacah lepton, asimetri cacah barion.

ABSTRACT

LEPTOGENESIS VIA SCATTERING IN MODIFIED MIRROR MODEL

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It has been built a scenario of leptogenesis via scattering interaction in Modified Mirror Model (MMM). This scenario is built to generate lepton number asymmetry in mirror sector ($\Delta_{L'}$) and real sector (Δ_L) in MMM, to produce baryon number asymmetry in each sector and estimates the ratio of mirror matter energy density (Ω_{mm}) with real matter energy density (Ω_{rm}). From the calculations, for reheating temperature in the mirror sector ($T_{R'}$) which is the same as in the real sectors (T_R), $T_{R'}, T_R 10^9$ GeV, but smaller than the mass scale of singlet neutrino Majorana ($M 10^{12}$ GeV), $T_{R'} < M$ and $T_R < M$, mirror baryon number asymmetry ($\Delta_{B'}$) and real baryon number asymmetry (Δ_B) in both sectors are equal, $\Delta_{B'} = \Delta_B \cong 10^{-13} - 10^{-10}$, that affect the mirror baryon energy density ($\Omega_{B'}$) to be equal to the real baryon energy density (Ω_B), $\Omega_{B'} = \Omega_B$. The amount of mirror matter energy density (Ω_{mm}) is approximately 5 times the real matter energy density ($\Omega_{rm} \sim \Omega_B$), $\Omega_{mm} \simeq 5\Omega_B$. The mirror matter energy density consists of 80% mirror electrons energy density (Ω_{E_m}) and the remainder (20%) is mirror baryons energy density, $\Omega_{E_m} = 4\Omega_{B'}$. The ratio of mirror matter energy density and real matter energy density is in concordance to the observation of *CMB* which states that dark matter energy density (Ω_{dm}) approximately 5 times the visible matter energy density (Ω_{vm}) that being dominated by visible baryon matter density (Ω_{B_v}), $\Omega_{dm} \simeq 5\Omega_{B_v}$.

Keywords: leptogenesis, modified mirror model, lepton number asymmetry, baryon number asymmetry.