



ID de Contribution: 4

Type: **Non spécifié**

Dirac phase leptogenesis

mercredi 5 mars 2008 17:05 (5 minutes)

As it was recently realized, flavor effects in leptogenesis modify the established “unflavored” picture in many ways. One of them is the appearance of a link between low-energy CP violating phases and the matter-antimatter asymmetry of the Universe. In particular, the only phase in the PMNS mixing matrix that one can hope to measure in the future, i.e. the Dirac phase, can be the unique source of CP violation necessary to explain the observed matter-antimatter asymmetry of the Universe. In the hierarchical limit for the heavy neutrinos, the Dirac phase can play this role, although the allowed parameter space is quite small and mainly in the weak wash-out, i.e. with dependence on the initial conditions. A way to overcome these difficulties is to go to degenerate heavy neutrinos. There, nice constraints involving low-energy parameters like θ_{13} and m_1 could be found from successful leptogenesis.

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Classification de Session: Young Scientist Forum 2