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Neutrino oscillations breaking isotropy in the early Universe

Collective neutrino oscillations are known to amplify anisotropies and inhomogeneities for supernova neutrinos. In this talk, I will consider neutrino oscillations in the early Universe, assumed to be almost perfectly isotropic and homogeneous. However, collective oscillations can, also in this case, amplify a small initial anisotropy by many orders of magnitude. This will be demonstrated in a simple model by performing a linear stability analysis as well as a full numerical solution, and the effect on the effective number of neutrinos will be discussed.

Primary author: HANSEN, Rasmus Sloth Lundkvist (Niels Bohr Institute)

Presenter: HANSEN, Rasmus Sloth Lundkvist (Niels Bohr Institute)

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