

Exercise for Colours and Flavours and their consequences

Autumn 2019: lecture 2

1 Neutrino mixings

For simplicity stick to a two neutrino mixing scheme. Plot the mixing formula for a few energies of neutrinos and mixing angles. Take the solar angle and an energy of 1 MeV and check distances in 100km range and in the sun-earth range. Then take an energy of 3 GeV and check distances in the hundreds of km range as well as in the thousands range (long range accelerator and atmospheric range). For the latter plotting in terms of $\cos \theta$ might be more informative.

See if you get a feeling for all the constraints in the PDG review:

Fig. 14.16 in <http://pdg.lbl.gov/2019/reviews/rpp2018-rev-neutrino-mixing.pdf>