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Towards distinguishing Dirac from Majorana neutrino mass with gravitational waves

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I will talk about how to distinguish the nature of neutrino masses, Dirac vs Majorana, from the spectrum of gravitational waves generated. I will discuss two simple models of Majorana and Dirac mass genesis motivated by generating small neutrino masses without assuming tiny Yukawa couplings. For Majorana neutrinos, spontaneous breaking of the gauged $U(1)_{B-L}$ symmetry gives a cosmic string induced gravitational wave signal flat over a large range of frequencies, whereas for Dirac neutrinos, spontaneous and soft-breaking of a Z_2 symmetry generate a peaked gravitational wave spectrum from annihilation of domain walls. The striking difference between the shape of the spectra in the two cases can help differentiate between Dirac vs Majorana neutrino masses in the two class of models considered, complementing results of neutrinoless double beta decay experiments.

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