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Gravitationally Confined Relativistic Neutrinos and Mathematical Modeling of the Structure of Pions

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Abstract : We use special relativity to compute the inertial and thus gravitational mass of relativistic electron and muon neutrinos, and we find that, for neutrino kinetic energies above 150 MeV/c2, these masses are in the Planck mass range. Consequently, we develop a simple Bohr-type model using gravitational rather than electrostatic forces between the rotating neutrinos as the centripetal force in order to examine the bound rotational states formed by two or three such relativistic neutrinos. We find that the masses of the composite rotational structures formed, are in the meson and baryon mass ranges, respectively. These models contain no adjustable parameters and by comparing their predictions with the experimental values of the masses of protons and pions, we compute a mass of 0.0437 eV/c2 for the heaviest electron neutrino mass and of 1.1 x10-3 eV/c2 for the heaviest muon neutrino mass.

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