

The effect of inclusion of Delta resonances in relativistic mean-field model with scaled hadron masses and coupling constants

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Knowledge of the equation of state of baryon matter at large densities plays a decisive role in description of neutron star interiors. With an increase of the baryon density filling of the Fermi seas of the hyperons and delta-isobars becomes possible. The inclusion of the hyperons and delta resonances into standard relativistic mean-field models results in a strong softening of the equation of state and a lowering of the maximum neutron star mass below masses of two known pulsars. We extend our recently developed relativistic mean-field model with scaled hadron masses and couplings, and with hyperons, taking into account of delta resonances and we analyze available empirical information to put constraints on the couplings of Δ s with meson fields. We show, that with the inclusion of delta isobars our equation of state satisfies the majority of presently known experimental constraints.

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