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Neutron stars within the Bogoliubov quark-meson coupling model

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A quark-meson coupling model based on the quark model proposed by Bogoliubov for the description of the quark dynamics is developed and applied to the description of neutron stars. Starting from a $SU(3)$ symmetry approach, it is shown that this symmetry has to be broken in order to satisfy the constraints set by the hypernuclei and by neutron stars. The model is able to describe observations such as two-solar-mass stars or the radius of canonical neutron stars within the uncertainties presently accepted. If the optical potentials for Λ and Ξ hyperons in symmetric nuclear matter at saturation obtained from laboratory measurements of hypernuclei properties are imposed, the model predicts no strangeness inside neutron stars.

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