



## The asymmetric nuclear matter correlated states in the LOCV framework

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### Abstract

The nucleon-nucleon correlations of asymmetric nuclear matter (ASM) in the  $^3S_1$ - $^3D_1$  and the  $^3P_2$ - $^3F_2$  states with the AV18 and the AV $\chi$ 6 potentials are studied in the lowest order constrained variational (LOCV) method. In these computations, the tensor (or the spin-orbit) correlations are considered in the  $^3S_1$ - $^3D_1$  ( $^3P_2$ - $^3F_2$ ) state. The energy, as well as the healing distance of the ASM in the mentioned states, are reported. It is demonstrated that by decreasing the proton to neutron ratio, the non-central correlations (healing distances) of the coupled states grow. It is shown that the ASM non-central correlations and energies in the  $^3P_2$ - $^3F_2$  state are more sensitive to the interaction than those of  $^3S_1$ - $^3D_1$  state.

**Keywords:** nucleon-nucleon correlation, coupled states, asymmetric nuclear matter, LOCV

For full article, refer to the Persian section