Abstract: We calculate the mass modification of $\Delta (1232)$ as well as $N (939)$ in symmetric and asymmetric nuclear matter based on the parity partner structure, where they have a certain amount of the chiral invariant mass. We study phase structure of our model in cold dense matter and find that the onset density of $\Delta$ matter is around two or three times the normal nuclear matter density.

We also calculate the effective masses, pressure and symmetry energy to study how the transition to $\Delta$ matter affects such physical quantities. We observe that the physical quantities change drastically at the transition density.