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Roles of A_1 meson exchange interaction in the hypernuclear non-mesonic weak decay observables KAZUNORI ITONAGA, Lab. of Physics, Faculty of Medicine, University of Miyazaki, Japan, TOSHIO MOTOKA, Lab. of Physics, Faculty of Engineering, Osaka Electro-com. University, Japan, TAMOTSU UEDA, Chiyoda-cho, Hiroshima, Japan, TH. A. RIJKEN, Inst. for Theoretical Physics, University of Nijmegen, The Netherlands — The most puzzling and challenging problem in the nonmesonic weak decay at present is to resolve the large discrepancy between the theory and the data of asymmetry parameters of the proton emitted in the decay of ${}^5_{\Lambda}\text{He}$ and ${}^{12}_{\Lambda}\text{C}$. In our previous meson exchange model, the 1π , $2\pi/\sigma$, $2\pi/\rho$, 1ω and $1K$ exchange mesons are employed. The π and σ mesons are chiral partners and play role to bring the right magnitude of the decay rates. In the present study we introduce the a_1 meson exchange in the decay interactions, where the a_1 meson is 1^+ and is a chiral partner of the ρ meson. In our model, we consider the $a_1 \rightarrow \rho\pi$ decay process in the intermediate meson exchange and the π is connected to the weak $\Lambda N\pi$ vertex. By choosing the appropriate coupling constants, we construct the $\rho\pi/a_1$ exchange potential $V_{\rho\pi/a_1}$. We will discuss on the roles of $\rho\pi/a_1$ exchange potential on the asymmetry parameter and other weak decay observables.

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