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**Tensor-correlated shell and cluster models and their applications to He isotopes** TAKAYUKI MYO, RCNP, Osaka University, KIYOSHI KATO, Hokkaido University, HIROSHI TOKI, RCNP, Osaka University, KIYOMI IKEDA, RIKEN — We investigate the effect of the tensor correlation (TC) in light nuclei. TC is mainly the correlation of proton-neutron pair and also related to the cluster correlation. In previous studies, we have extended the model space of  ${}^4\text{He}$  from  $(0s)^4$  to  $(0s)^4 + (0s)^2(0p)^2$  in order to incorporate TC in model space description. We have also shown that TC produces about a half of the LS splitting in  ${}^5\text{He}$  (Prog.Theor.Phys.113(2005)783), and contributes to the breaking of the shell closure in  ${}^{11}\text{Li}$  (last JPS meeting). Here, these results depends on the amount of TC in nuclei. Then, in this talk, we examine how much our model represents TC. To do this, we extend the model space for  ${}^4\text{He}$  as follows; (1) we mix the  $sd$  shell in addition to the  $0s+0p$  shells, (2) we improve the single particle wave function from the harmonic oscillator basis to the one expanded with a finite number of the Gaussian bases. Again, we solve the “tensor-correlated  ${}^4\text{He}$  cluster”+ $n$  problem to see the coupling effect between TC and a valence neutron.

Takayuki Myo  
RCNP, Osaka University

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