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Large-scale shell model calculations for two-neutrino double-beta decay of 48Ca[1] YORITAKA IWATA, NORITAKA SHIMIZU, The University of Tokyo, YUTAKA UTSUNO, Japan Atomic Energy Agency, MICHIO HONMA, University of Aizu, TAKASHI ABE, TAKAHARU OTSUKA, The University of Tokyo — Two-neutorino double-beta decay of ^{48}Ca is studied based on large-scale shell model calculations. According to the experiments by Yako et al., shell model calculations accounting only for one major shell (pf shell) possibly underestimate the Gamow-Teller transition strength from ^{48}Ca to ^{48}Sc and that from ^{48}Sc to ^{48}Ti. It may imply that the shell model calculations accounting only for pf shell fails to evaluate the contribution of the highly-excited 1^+ state of ^{48}Sc, where the Gamow-Teller transition is the main process of two-neutrino double-beta decay. In this paper, a large-scale shell model calculations including two major shells is carried out. By expanding the model space from pf shell to sdpf shell, the effect due to the excitation of nucleons from sd shell to pf shell is taken into account. In this model space the proton excitation states, which is expected to play an important role in both low and high energy excited states of 48Ca, 48Sc and 48Ti, can appear. Consequently the effect due to the excitation across the two major shells is evaluated as Gamow-Teller transition strength from ^{48}Ca to ^{48}Sc, that from ^{48}Sc to ^{48}Ti, and two-neutrino double-beta decay matrix element of ^{48}Ca.

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