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Role of the order parameter manifold on surface Majorana fermions and spin susceptibility of superfluid ^{3}He-B TAKESHI MIZUSHIMA, Dept. of Phys., Okayama University, MASATOSHI SATO, ISSP, The University of Tokyo, KAZUSHIGE MACHIDA, Dept. of Phys., Okayama University — Here, we theoretically investigate surface Andreev bound states (SABS) in superfluid ^{3}He-B confined to a slab geometry. It is known that the Majorana property gives rise to the Ising anisotropy of spin susceptibility on the surface, which reflects the assumption that the order parameter manifold of the B-phase is restricted to the subspace. In this talk, we first demonstrate that the SO(3) manifold, which describes the relative rotation of spin and orbital, plays a critical role on the various properties associated with the SABS, such as the Majorana nature, gapless dispersion, topological invariant, and spin susceptibility. Then, based on the quasiclassical Eilenberger theory which takes account of the dipole interaction, we quantitatively discuss thermodynamics and the Majorana property of the SABS in superfluid ^{3}He-B under a magnetic field, where the Majorana property and spin susceptibility is determined by the interplay of the magnetic field and dipole interaction.

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