Entanglement Chern Number in Tree Dimensions\textsuperscript{1} HIROMU ARAKI, University of Tsukuba, TAKAHIRO FUKUI, Ibaraki University, YASUHIRO HATSUGAI, University of Tsukuba — We have characterized some of topological phases by the entanglement Chern number (e-Ch), which is defined as the Chern number of the entanglement Hamiltonian.\textsuperscript{2} The partition of the system is not necessarily spatial but can be spin partition, which is the extensive partition. If a system respects the time reversal symmetry, the Chern number is trivial but the e-Ch can be non-zero. For instance, the e-Ch characterizes the quantum spin Hall phase of the Kane–Mele model and its phase diagram by the $\mathbb{Z}_2$ topological number is successfully reproduced by the e-Ch.\textsuperscript{3} For the Fu–Kane–Mele model,\textsuperscript{4} its weak phases are well described by the non trivial section e-Ch and the strong phase is characterized by the existence of the Weyl points of the entanglement Hamiltonian.\textsuperscript{5}

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