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**Nature of topological quantum phase transition in chiral spin liquid** SUK BUM CHUNG, HONG YAO, Stanford University, EUN-AH KIM, Cornell University, STEVEN KIVELSON, Stanford University — How to best characterize and detect topological order, which is not associated with any local broken symmetry is one of central questions in the field of topological phases. While the ground state degeneracy that depends on the topology of the manifold the system is defined in has been a successful theoretical indicator of topological order, this concept is applicable only at $T = 0$ and not accessible experimentally. Another important indicator has been topological entanglement entropy. However, topological entanglement entropy at $T = 0$ can be the same for two distinct topological phases. Here we study an exactly solvable model first introduced in Ref.[1], motivated by the fact that the existence of topological quantum phase transition is known and the full spectrum is available. We examine the nature of Abelian to non-Abelian topological quantum phase transition by studying the expectation value of global flux which shows an abrupt jump at the critical point. We discuss the phase diagram of this quantum phase transition in terms of the global flux and entanglement entropy and discuss to what extent the existence of topologically ordered ground state with non-Abelian excitations is revealed at finite temperature. [1] H. Yao and S.A. Kivelson, PRL **99** 247203 (2007).

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