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Conducting state of GeTe by defect-induced topological insulating order JINWOONG KIM, Department of Physics, Pohang University of Science and Technology, SEUNG-HOON JHI, Department of Physics and Division of Advanced Materials Science, Pohang University of Science and Technology — Topological insulating order protected by time-reversal symmetry is robust under structural disorder. Interestingly, recent studies on phase change materials like GeSbTe showed that their topological insulating order is sensitive to atomic stacking sequences. It was also shown that their structural phase transition is correlated with topological insulating order. GeTe, a well-known phase change material, is trivial insulator in its equilibrium structure. In this study, we discuss how atomic defects such as Ge tetrahedral defect observed in amorphous GeTe can change its topological insulating order based on first-principles calculations and model Hamiltonian. We also investigated the critical density of such tetrahedral defects to induce topological insulating order in GeTe. Our study will help explore hidden orders in GeTe.

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