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**Ab initio study of topological order induced by symmetry breaking in PbTe** JINWOONG KIM, Department of Physics, POSTECH, SEUNGHOON JHI, Department of Physics and Advanced Materials Science Division, POSTECH — Topological insulator (TI) is a new class of materials that have an energy gap in bulk phase but contain linear and chiral band dispersions on their surface. The topological insulating order can be initiated by parity inversion in time-reversal symmetric momenta. We studied the topological insulating properties of PbTe under uniaxial strain using first-principles methods. PbTe is a narrow-gap semiconductor with trivial topological insulating order. While it is known to have band inversion under pressure at a time-reversal symmetric k-point, the degeneracy at the k-point prevents the overall parity inversion which is needed to induce the TI order. In this presentation, we show that uniaxial strain can break the symmetry and thus induce topologically nontrivial order in PbTe.

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