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Disorder and inversion symmetry breaking effect in Chern insulators LUCIAN COVACI, University of Antwerpen, JOSE GARCIA, TATIANA RAPPOPORT, Universidade Federal do Rio de Janeiro — We show that Chern insulators with and without inversion symmetry respond differently to strong disorder. We consider a Haldane model with Anderson disorder and and use a real-space numerical approach to calculate the conductivity tensor of a Haldane model in the presence of Anderson disorder. The inversion symmetry is explicitly broken by adding a sub-lattice potential Δ_{AB}. While disorder closes the gap and destroys the Chern insulator in the system with inversion symmetry, the quantum anomalous Hall effect is insensitive to increasing Anderson disorder in the case of broken symmetry. In this case, the symmetry breaking works as a valley filter that protects the topological state from inter-valley scattering and strong disorder gives rise to a novel topological state that is similar to the topological Anderson insulator.

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