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Quantum criticality of 1D topological Anderson insulators[1] ALEX KAMENEV, University of Minnesota, DMITRY BAGRETS, ALEX ALTLAND, University of Koln — We present an analytic theory, based on exact transfer-matrix solutions of super-symmtetric nonlinear sigma-models, of quantum criticality in quasi one-dimensional topological Anderson insulators. We describe these systems in terms of two parameters (g, χ) representing localization and topological properties, respectively. Certain critical values of χ (half-integer for Z classes, or zero for Z2 classes) define phase boundaries between distinct topological sectors. Upon increasing system size, the two parameters exhibit flow similar to the celebrated two parameter flow of the integer quantum Hall insulator. However, unlike the quantum Hall system, an exact analytical description of the entire phase diagram can be given. We check the quantitative validity of our theory by comparison to numerical transfer matrix computations.

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