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Kondo lattice on the edge of a 2D topological insulator JOSEPH MACIEJKO, Princeton Center for Theoretical Science — Much attention has been devoted recently to the experimental and theoretical study of the effect of magnetic impurities on the stability of the gapless boundary modes of topological insulators. When the quantum dynamics of the impurities is considered, those boundary modes constitute novel types of fermionic baths which may affect the nature of possible impurity phases and phase transitions. We study a regular one-dimensional array of quantum magnetic impurities interacting with the helical edge liquid of a two-dimensional time-reversal invariant topological insulator. Exact solutions at the special Toulouse and Luther-Emery points as well as a renormalization group analysis à la Anderson-Yuval allow us to construct a phase diagram in the space of Kondo coupling, electron-electron interaction strength, and electron density. We point out similarities and differences with the Kondo lattice in a ordinary one-dimensional electron gas.

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