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Supersymmetry approach to delocalization transitions in a network model of the weak field quantum Hall effect and related models. SHANTHANU BHARDWAJ, Univ of Chicago, VAGHARSH MKHITARYAN, University of Utah, ILYA GRUZBERG, Ohio State University — We consider a recently proposed network model of the integer quantum Hall (IQH) effect in a weak magnetic field. Using a supersymmetry approach, we reformulate the network model in terms of a superspin chain. A subsequent analysis of the superspin chain and the corresponding supersymmetric nonlinear sigma-model allows to establish the analytical form of the critical line of the weak-field IQH transition, which separates the Anderson insulator and the quantum Hall insulator phases. Our results also confirm the universality of the IQH transition, which is described by the same sigma model in strong and weak magnetic fields.

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