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Integrable supersymmetric quantum circuit

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The Floquet Baxterization was introduced as a bridge between quantum integrable models and quantum circuits. In this work we revisit the Floquet Baxterization extending it to graded \mathbf{R} matrices, introducing an integrable supersymmetric brick-wall quantum circuit. The brick-wall circuit is made up by the \mathbf{S} -matrix of a supersymmetric particle theory in 1+1 dimensions as unitary gates. The analysis will focus on the limit between the inhomogeneous and homogeneous brick-wall, uncovering some of the rich structure hidden in the quantum circuit. We consider two limits for the \mathbf{S} -matrix, the first with equally massive particles that will give rise to the Kitaev chain at the critical point. The second with particle with different masses that will give rise to an extended dimerized Kitaev Chain.

Primary author: RICHELLI, Pietro (University of Amsterdam)

Presenter: RICHELLI, Pietro (University of Amsterdam)

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