

New integrable models: from short to long-range deformations.

The integrability toolkit provides a powerful way to solve certain quantum models. It plays a role in several different areas of physics, being in particular responsible for remarkable progress in the context of AdS/CFT and statistical physics, and more recently in quantum circuits. Therefore, asking whether a model is integrable is a very relevant question, but not always an easy one. In this talk, I will discuss two methods to construct integrable models. The first allows to classify integrable models whose Hamiltonians have nearest-neighbour interaction, while the second can also be applied to long-range spin chains. Examples will include new integrable deformations of AdS2 and AdS3 S-matrices; and the Lax operator and R-matrix of the two-loop SU(2) sector in N=4 SYM. I will also show that all known range 3 integrable deformations of the 6-vertex model are generated by an R-matrix.

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