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The complete spectrum of spin-1/2 XXZ chain at root of unity

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We have studied the complete spectrum of spin-1/2 XXZ chain at root of unity, i.e. a paradigmatic model of quantum integrability. Making use of transfer matrix fusion relation, we constructed a family of 2-parameter transfer matrices, which help us obtain all the eigenstates in terms of Bethe roots. This elucidates a long-standing problem dated from the debate between McCoy and Baxter. We also exemplify the applications in the thermodynamic limit, which explains the rôle of quasi-local Z charge in the presence of quantum quenches and generalised hydrodynamics.

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