SU(3) chains and the Haldane gap

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At low energies, we map the antiferromagnetic SU(3) chain in the symmetric-p representation to a relativistic field theory with topological angle $\Theta$. We generalize Haldane’s conjecture to this class of spin chains.

Haldane’s Conjecture in SU(3)

If $p = 3m$, there is an energy gap to all excited states; otherwise, there are gapless excitations.