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A family of spin- S chain representations of $SU(2)$ level k Wess-Zumino-Witten models MARTIN GREITER, Institut fuer Festkoerperphysik, KIT, Postfach 3640, 76021 Karlsruhe, Germany, RONNY THOMALE, Department of Physics, Stanford University, Stanford, CA 94305, USA, STEPHAN RACHEL, Department of Physics, Yale University, New Haven, CT 06520, USA, PETER SCHMITTECKERT, Institute fuer Nanotechnologie, KIT, 76344 Eggenstein-Leopoldshafen, Germany — We investigate a family of spin- S chain Hamiltonians recently introduced by one of us [M. Greiter, Mapping of Parent Hamiltonians, Springer Tracts in Modern Physics, Vol 244 (Springer, Berlin, 2011)]. For $S = 1/2$, it corresponds to the Haldane–Shastry model. For general spin S , we numerically show that the low-energy theory of these spin chains is described by the $SU(2)_k$ Wess–Zumino–Witten model with coupling $k = 2S$. In particular, we investigate the $S = 1$ model whose ground state is given by a Pfaffian for even number of sites N . We reconcile aspects of the spectrum of the Hamiltonian for arbitrary N with trial states obtained by Schwinger projection of two Haldane–Shastry chains.

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