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Spectrum of superintegrable chiral Potts model and $L(\mathfrak{sl}_2)$ symmetry in associated XXZ-type spin chain AKINORI NISHINO, Institute of Industrial Science, The University of Tokyo, TETSUO DEGUCHI, Department of Physics, Ochanomizu University — We study the correspondence between the Ising-like spectra of superintegrable N-state chiral Potts (SCP) model [1,2] and the energy degenerate subspaces of XXZ-type spin chain, called nilpotent Bazhanov-Stroganov (NBS) model [3], whose transfer matrix commutes with the SCP transfer matrix. We show that, if the number of sites is a multiple of N, the NBS model has a loop algebra $L(\mathfrak{sl}_2)$ symmetry in the subspace with Z_N -charge $Q=0$. Applying the approach [4] to the case, we obtain the dimension of $L(\mathfrak{sl}_2)$ -degenerate subspaces through the calculation of Drinfeld polynomials. The Drinfeld polynomials are in fact identified with Baxter's polynomials [2] characterizing the SCP's Ising-like spectra, which shows that each subspace with the Ising-like spectra have the same dimension as the corresponding $L(\mathfrak{sl}_2)$ -degenerate subspace of NBS model. [1] G. Albertini, B. M. McCoy, J. H. H. Perk and S. Tang, Nucl. Phys. B 314 (1989) 741. [2] R. J. Baxter, J. Statist. Phys. 57 (1989) 1. [3] V. V. Bazhanov and Yu. G. Stroganov, J. Statist. Phys. 59 (1990) 803. [4] T. Deguchi, cond-mat/0503564.

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