

## Correlation functions for integrable higher spin $su(2)$ quantum chains

For integrable quantum spin chains a lattice path integral formulation with finite but arbitrary Trotter number allows to derive a set of discrete functional equations with respect to the spectral parameters appearing in the R-matrices of local interactions. We show that these equations yield a unique characterisation of the density operator and present solutions for the  $S=1/2$  and  $S=1$  Heisenberg chains. We derive algebraic formulas for the density matrices of finite segments of the integrable  $su(2)$  isotropic spin-1 chain in the thermodynamic limit. We give explicit results for the 2 and 3 site cases for arbitrary temperature  $T$  and zero field. In the zero temperature limit the correlation functions are given in elementary form in terms of Riemann's zeta function at even integer arguments.