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Spin Correlation Functions on Pyrochlore Lattice

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Pyrochlores have the chemical formula $A_2B_2O_7$ with A, B or both magnetic. It has corner-sharing tetrahedra in the structure, therefore, frustration phenomena naturally occurs in these systems. Because of the frustration, pyrochlore have many interesting properties, including the spin glass in $Y_2Mo_2O_7$, spin liquid in $Tb_2Ti_2O_7$, disordered spin ice in $Ho_2Ti_2O_7$, and ordered spin ice in $Tb_2Sn_2O_7$. I will focus on $Tb_2Ti_2O_7$ particularly, use perturbation theory to find the spin correlation function between the nearest neighbour for the spin $1/2$ system.

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