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A Superintegrable Model on the 3-sphere with Reflections and the Rank 2 Bannai-Ito Algebra

I shall present a quantum superintegrable model on the 3-sphere with reflections. Its symmetry algebra will be identified as the rank-two Bannai-Ito algebra. It will be shown that the Hamiltonian can be constructed from the tensor product of four irreducible representations of the superalgebra $\text{osp}(1,2)$ and that its superintegrability is naturally understood in that setting. The exact separated solutions will be obtained through the Fisher decomposition and a Cauchy-Kovalevskaja extension.

Based on work done in collaboration with H. De Bie (Ghent), V. X. Genest (MIT), J.-M. Lemay (CRM).