

Comparative Studies of Crystal Field Effects in YbCoGaO₄ and YbMgGaO₄ Single Crystals

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Spin geometrically frustrated systems attract a lot of attention because of specific magnetic properties like spin glass and spin liquid materials. The YbMgGaO₄ single crystal is a good quantum spin liquid candidate with two-dimensional and special isotropic magnetic triangular-lattice [1, 2]. In contrast the YbCoGaO₄ single crystal presents a unique three-dimensional Ising-like spin glass behavior. These single crystals were grown using the optical floating zone image furnace technique [3]. In this paper the properties of the ground-state Kramers doublet of Yb³⁺ have been investigated to assess their influence on the electronic structure of both crystal. We plan to solve following problems:

1. Differences in mechanisms responsible for randomness in both crystals. These differences should be seen in low temperature linewidths of optical absorption transitions $^2F_{7/2} \rightarrow ^2F_{5/2}$ [4].
2. Differences in g-factors in the ground-state Kramers doublet of Yb³⁺ in both crystals [5,6].

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