RELATION BETWEEN MAGNETISM AND THERMOELECTRICITY IN SODIUM AND MISFIT COBALTATES

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The recent discovery of unexpectedly large figure of merit in the Cobaltates Na_xCoO_2 has opened a new route to large scale applications. There, orbital or spin degrees of freedom together with strong correlations might be used as an independent source of entropy resulting in large TEP together with good conductivity. Understanding the origin of the correlations in this promising compound and their interplay with transport and thermoelectric properties is a key element to settle this issue. This would help to decide whether low dimensional strongly correlated oxides could play a role in the future developments of thermoelectricity.

In this frame, we measured magnetic correlations through NMR, μSR, transport and thermoelectric properties in both Bi-misfit and Na cobaltates [1,2,3]. Both compounds display large TEP and similar magnetic properties as probed by NMR. Large TEP occurs simultaneously with a Curie-Weiss behavior at low carrier doping, revealing the presence of correlations in both compounds. But charge and spin orderings are found only in the Na cobaltates, induced by the ordering of the Na layers. This comparison demonstrates that large TEP in these oxides are linked with strong correlations, but not with charge or spin orders.

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