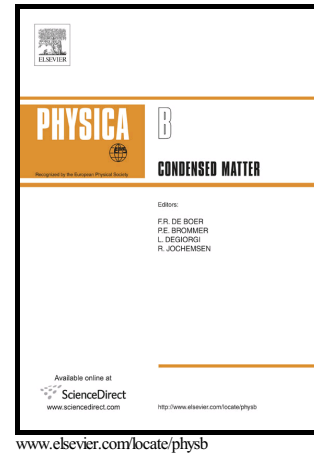


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An effect of Sm vacancies on the hybridization gap in topological Kondo insulator candidate SmB_6

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Abstract

An origin of the topological state in Kondo insulator SmB_6 is predicted to be hybridization gap which opens in this compound at low temperatures. We demonstrate that hybridization gap is very sensitive to the presence of Sm vacancies, and at the amount of vacancies above 1 % the gap fills in with impurity states. In this work we present a comparative study of the in-gap density of states due to Sm vacancies by Raman scattering spectroscopy and heat capacity for samples where the number of Sm vacancies is equal or below 1 %.

Keywords: topological insulator, Kondo insulator, hybridization gap, Raman scattering

1. Introduction

A theoretical and experimental discovery of topological insulators is one of the most exciting recent achievements in the field of condensed matter physics. Originally, topological surface states were suggested in band insulators with strong spin-orbit coupling where the band gap and bands inversion is a result of their band structures. Latter it was suggested that materials which demonstrate
 5 a band gap and band inversion as a result of strong electron interactions, so

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