

Bose glass behavior in diluted quantum spin $(\text{Yb}_{1-x}\text{Lu}_x)_4\text{As}_3$ chain

R. Matysiak,¹ G. Kamieniarz,² P. Gegenwart,^{3,4} A. Ochiai,⁵ and F. Steglich⁴

¹*Institute of Engineering and Computer Education,
University of Zielona Góra, Poland*

²*Computational Physics Division, Faculty of Physics,
A. Mickiewicz University, Poland*

³*Experimental Physics VI, Center for Electronic Correlations and Magnetism,
University of Augsburg, Germany*

⁴*Max Planck Institute for Chemical Physics of Solids, Germany*

⁵*Center for Low Temperature Science, Tohoku University, Japan*

We have measured and analyzed the field-dependent effects in the specific heat C of the poly-domain site-diluted compound $(\text{Yb}_{1-x}\text{Lu}_x)_4\text{As}_3$, where $x = 0.01$ and 0.03 , which is an ideal realization of the linear Heisenberg antiferromagnet for $x = 0$. We demonstrate [1] that the fraction of C arising from the chains perpendicular to the applied field fulfils at low temperature the scaling behavior which is considered the thermodynamic signature of the Bose-glass phase and is rarely observed in low dimensional spin systems.

References:

[1] G. Kamieniarz, R. Matysiak, P. Gegenwart, A. Ochiai, F. Steglich, Physical Review B **94**, 100403(R) (2016).