

Interaction of very cold neutrons with matter

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Abstract

Due to a heightened interest in short and medium range order interactions in materials (e.g. in biology and life sciences), there will be an increasing demand for very cold neutron (VCN) scattering in the foreseeable future. However, very little data exists about the interaction of VCNs with matter. Even for seemingly trivial systems, striking discrepancies exist between the few experimentally determined total cross-sections published during the last decades and the standard models (LEAPR etc.).

Using a modified setup of the low-Q diffractometer at LANSCE, we measured the total cross-section of water and other materials in the VCN regime.

In this talk, we will present our findings and discuss possible consequences for both VCN scattering theory and instrumentation.