

Magnetic micro-calorimeters for neutrino experiments

Dr. Loredana Gastaldo

Kirchhoff-Institut für Physik, Heidelberg

Metallic magnetic micro-calorimeters are energy dispersive detectors operated at temperatures below 0.1 Kelvin. Their resolving power $E/\Delta E$ approaching 5000, the intrinsic response time well below 1 μs and the excellent linearity make magnetic micro-calorimeters very attractive for numerous experiments.

With these detectors we have performed the first high resolution calorimetric measurements of the Ho-163 electron capture spectrum. The achieved performance motivated the formation of the international collaboration ECHo (Electron Capture Ho-163) to investigate the electron neutrino mass in the sub-eV range using the Ho-163.

For the search of neutrinoless double beta decay in Mo-100 with scintillating crystals, we have developed photon and phonon detectors based on metallic magnetic calorimeters to be used in the experiments AMoRE and LUMINEU.

In this talk, the ECHo experiment as well as the other applications of metallic magnetic calorimeters for neutrino physics will be discussed.