

# Precision Gamma-Ray Spectroscopy at the Institut Laue Langevin

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## Abstract

The Institut Laue-Langevin (ILL) operates the most powerful source of neutrons in the world, a 58 MW reactor. The reactor forms the basis for a program of research covering a wide variety of fields, supplying neutrons to a broad range of instruments. The majority of instruments are dedicated to applications in solid-state physics but there is also a small, active group performing nuclear structure investigations with the aid of neutrons.

Today we follow two main experimental issues in the ILL nuclear physics studies. In the first one thermal neutron capture is used to excite nuclei up to the binding energy. Subsequently emitted gamma rays are characterized with ultra-high precision using the crystal spectrometers *GAMS*. In the second one, neutron-induced fission allows the study of the structure of heavy neutron-rich isotopes using the *LOHENGRIN* recoil mass separator. Most of today's measurements at ILL are done using the in-pile target arrangements of these two instruments, but some work is also carried out with neutrons at external positions fed by neutron guides.

We will present an overview on the current status of the various experimental approaches and discuss the results and applications of a selected set of measurements.