Magnetic Moments of Isomeric States around N=40

G. Georgiev
For the E322 (GANIL), N4 (Orsay) and 03015 (MSU) collaborations

1 CSNSM, CNRS/IN2P3; Univ. Paris-Sud, UMR8609, ORSAY-Campus, F-91405, France

The nuclear magnetic moments are highly sensitive probes to the purity of the nuclear wave function and to its single-particle components. They serve as a stringent test to the nuclear models. In the last few years there have been a number of experiments performed in order to study the magnetic moments of nuclear states having the neutron \( g_{9/2} \) orbital as a main component in their structure. These states appear as short-lived isomers in the Ni isotopes in the vicinity of N=40. The knowledge on their structure can shed light on the importance of \( \nu g_{9/2} \) for the stabilization observed in the \( ^{68}\text{Ni} \) region and how far these effects are propagating with the addition of neutron and/or proton particles or holes.

Results obtained for nuclei bellow N=40 in projectile fragmentation for \( ^{67}\text{m}\text{Ni} \) at GANIL and in transfer reactions for \( ^{63}\text{m}\text{Ni} \) and \( ^{65}\text{m}\text{Ni} \) from Orsay will be presented. The emphasis will be put on the result from a resent measurement at MSU in which the \( g \) factor of the \( 8^+ \) isomeric state in \( ^{70}\text{Ni} \) (N=42) has been determined. The technical developments and the necessity of the application of several production mechanisms will be outlined. The systematic \( g \)-factor study in the nickel isotopes will be compared with the \( g \) factors of \( 9/2^+ \) states in the neighboring nuclei. A comparison of the results obtained to large basis shell model calculations will try to shed more light on the structure in the region.