Magnetic Moments of Isomeric States around N=40

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

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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}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 ^{67m}Ni at GANIL and in transfer reactions for ^{63m}Ni and ^{65m}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}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.