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AGATA@GANIL(E731): Isospin Symmetry Breaking and Shape Coexistence in Mirror Nuclei ^{71}Kr - ^{71}Br

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The study of the nuclear deformation for nuclei between ^{40}Ca and ^{56}Ni , characterized by the $f_{7/2}$ proton and neutron shell, has historically played a fundamental role in developing the understanding of nuclear structure. In this mass region, the mirror pair ^{49}Cr and ^{49}Mn were well-studied through Mirror Energy Differences but the information on the evolution of quadruple collectivity is still limited for the ^{49}Mn because no lifetime for its excited states has been measured so far.

The experiment populated excited states in the mirror pair ^{49}Cr (2pn) and ^{49}Mn (p2n) nuclei using a fusion-evaporation reaction where a 115 MeV ^{36}Ar beam bombarded a CaO target. The detection of the gamma-rays was performed with AGATA (Advanced GAMMA Tracking Array) spectrometer at GANIL in June 2018, during AGATA, NEDA + Neutron Wall, DIAMANT campaign.

In order to determine the lifetimes of the excited states, two different software packages have been used to perform Doppler Shift Attenuation Method analysis. Both methods have been tested in the ^{49}Cr with compatible results and are being applied to the ^{49}Mn to obtain the excited states lifetimes. The results for the ^{49}Cr lifetimes are compatible with literature and some preliminary results of the ^{49}Mn have been compared with shell model predictions.

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