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New experimental signature for completing the vibrational struc- ture of cluster existence in the 212Po nucleus

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In 2011 an experiment was made with the EUROBALL IV array @Strasbourg. The main research goal was to study of the fission products using 18O beam and 208Pb as target. Nevertheless, the experiment lead also to the discovery of broadened y-rays belonging to the 212Po nucleus. These y-rays are aected by Doppler broadening and indicates that the lifetime of the states are lower than the stopping time of the 212Po in the target(~1.4ps). The values found in the [0,1-0,6]ps range lead to very enhanced E1 transitions and the states with non-natural parity [8-; 6-; 4-] could be explained by an alpha + 208Pb structure. However this experiment cannot highlight the 2- state expected in many theoretical calculations. This is why we made a new experiment @ JYFL laboratory (Jyväskylä, Finland) with JUROGAM II. Our hypothesis was that the cascade of the 2- state has only two gammas in coincidence, which is also the challenging issue in this analysis. This candidate has all required features for our hypothesis, but more investigations are needed for a complete conrmation. In this presentation we will discuss the analysis method and the main challenges of the experiment.

Auteur principal: M. MAQUART, Guillaume (IPNL)

Co-auteurs: Prof. ASTIER, Alain (CSNSM); Dr MANCUSO, Clement (IPNL)

Orateur: M. MAQUART, Guillaume (IPNL)

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