3rd Workshop on Level Density and Gamma Strength

"Study of high-lying collective modes with AGATA"

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We report on the status of the analysis of an AGATA-Demonstrator (AD) experiment aimed to study the gamma decay from giant resonances at zero temperature. The experiment has been performed in June 2010 at Laboratori Nazionali di Legnaro (LNL). The giant resonance modes have been excited by inelastic scattering of ^{17}O at 20 MeV/A (the highest energy available at LNL, provided by the ALPI accelerator) on a series of targets, such as ^{208}Pb, ^{90}Zr and ^{140}Ce, approximately 2 mg/cm2 thick. The scattered ions have been detected by two E-ΔE Si telescopes of the TRACE detector system, while the gamma decay has been measured by the AD (consisting of 3 triple clusters) coupled to an array of scintillation detectors, comprising 3 large volume $LaBr_3$ and 20 BaF_2 (3"x3") detectors. The experiment aimed at the measurement of a known case first, ^{208}Pb, but with improved experimental conditions, in particular concerning the energy resolution of the gamma detections. In contrast to the existing measurement concentrating mainly on the gamma decay of the giant quadrupole resonance (GQR) in the 10-13 MeV range, the experiment aimed also at the measurement of the lower excitation energy region between 5 to 10 MeV, where pygmy dipole structures exist but not all of them are well identified yet. Preliminary results, mainly on ^{208}Pb, will be presented.
In this and in other in-beam gamma spectroscopy experiments the detection of high energy gamma rays in the range up to 10-20 MeV is a fundamental aspect. The performance of AGATA detectors in this energy range has, however, never been studied in detail. A test measurement of the response to 15.1 MeV gamma rays has therefore been performed using two AGATA triple clusters operating at LNL. Part of the talk will be devoted to the presentation of the results of this study.