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NATURE OF PYGMY DIPOLE EXCITATION IN ^{74}Ge

In recent times, considerable progress has been made in the understanding of isospin nature of the pygmy dipole excitation both experimentally and theoretically. On experimental side, this has been due to advancement of techniques which now make it possible to compare the excitation pattern by probes of different isospin nature [1].

In this conference, we present results of such comparative study done on the pygmy dipole excitation in ^{74}Ge . The pygmy dipole states built on the ground state are excited by the inelastic alpha scattering. The excitation pattern thus observed is compared to that of observed in the photon scattering done on the same nucleus [2]. Experiment for the $^{74}\text{Ge}(\alpha, \alpha')^{74}\text{Ge}$ reaction was done with the AFRODITE array and a set of two identical charged particle telescopes of square silicon detectors [3]. The results show the presence of two energy regions between 6 to 9 MeV, which adhere to the scenario of the recently found splitting of the region of dipole excitations into two separated parts: one at low energy, being populated by both isoscalar and isovector probes, and the other at high energy, excited only by the electromagnetic probe. Relativistic quasiparticle time blocking approximation (RQTBA) calculations show a reduction in the isoscalar E1 strength with an increase in excitation energy, which is consistent with the measurement. This study may be the first step to learn more about the relation between isospin-splitting and neutron skin.

REFERENCES

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Primary authors: Dr NEGI, Dinesh (Centre for Excellence in Basic Sciences, Mumbai, India); WIEDEKING, Mathis (itl); Dr LANZA, Edoardo (INFN, Catania, Italy); Prof. LITVINOVA, Elena (Western Michigan University, Michigan, USA); Dr VITTURI, Andrea (INFN, Padova, Italy); BARK, Robert (iThemba LABS); Dr BERNSTEIN, Lee (University of California, Berkeley, USA); Dr BLEUEL, Darren (Lawrence Livermore National Laboratory, California, USA); BVUMBI, Suzan Phumudzo (University of Johannesburg); BUCHER, Thifhelimbilu Daphney (iThemba LABS); Dr DAUB, Brian (Lawrence Livermore National Laboratory, California, USA); DINOKO, Tshepo (University of the Western Cape/ iThemba LABS); Mr EASTON, Jason (University of the Western Cape, South Africa); Prof. GORGEN, Andreas (University of Oslo, Norway); Prof. GUTTORMSEN, Magne (University of Oslo, Norway); JONES, Pete (iThemba LABS); KHESWA, Bonginkosi (iThemba LABS); Ms KHUMALO, Nontobaco (University of the Western Cape, South Africa); Dr LARSEN, Ann-Cecilia (University of Oslo, Norway); LAWRIE, Elena (iThemba LABS); LAWRIE, Kobus (iThemba LABS); MAJOLA, Siyabonga (UCT/ITHEMBA LABS); MASITENG, Paulus (University of Johannesburg); NCHODU, Rudolph (iThemba LABS); NDAYISHIMYE, Joram (Stellenbosch University); NEWMAN, Richard (Stellenbosch University); NONCOLELA, Sive (UWC); ORCE, Nico (University of the Western Cape); PAPKA, Paul (Stellenbosch University); PELLEGGRI, Luna (University of the Witwatersrand and iThemba LABS); Dr RENSTROM, Therese (University of Oslo, Norway); ROUX, David G. (Rhodes University); Dr SCHWENGNER, Ronald (Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany); SHIRINDA, Obed (iThemba LABS); Prof. SIEM, Sunniva (University of Oslo, Norway)

Presenter: Dr NEGI, Dinesh (Centre for Excellence in Basic Sciences, Mumbai, India)

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