Lifetime measurements in neutron–deficient Te isotopes*

P. Vasileiou[1], T.J. Mertzimekis[1], A. Zyriliou[1], A. Chalil[2], M. Efstathiou[1], A. Karadimas[1], P. Koseoglu[3], N. Mărginean[4], C. Mihai[4], C. Costache[4], R. Borcea[4], R. Lica[4], and N. Florea[4]
[1] *Department of Phyiscs, National & Kapodistrian University of Athens, Athens, Greece*
[2] *Université Claude Bernard, Lyon 1, CNRS/IN2P3, IP2I Lyon, Villeurbanne, France*
[3] *Institut für Kernphysik, TU Darmstadt, Darmstadt, Germany and*
[4] *Horia Hulubei National Institute of Physics and Nuclear Engineering–IFIN–HH, Bucharest, Romania*

The neutron–deficient region around $A \sim 120$ presents many opportunities to study nuclear structure as single–particle degrees of freedom compete with collective phenomena to shape several of the spectroscopic properties observed. This work reports on the progress and the preliminary results of a recent experiment performed at IFIN–HH, in Magurele, Romania, aimed at measuring lifetimes of excited states in the neutron–deficient, even–even ^{116,118}Te, by means of the Fast Electronic Scintillation Timing (FEST, or fast–timing) technique [1]. A ^{11}B beam of $E_{lab} = 35$ MeV impinging on a 5 mg/cm^2 ^{nat}Ag target was used to populate excited states in ^{116,118}Te. The γ rays de–exciting these levels were detected by the ROSPHERE [2] array, loaded with 15 HPGe + 10 $LaBr_3$(Ce) detectors. Additionally, the SORCERER [3] particle detector array was coupled to ROSPHERE, enabling the study of $p-\gamma$ and $p-\gamma-\gamma$ coincident events. The experimental results, in synergy with theoretical predictions stemming from a variety of models, among which the recently developed proxy–SU(3) [4], are expected to provide insight on the dynamical shape evolution of the studied isotopes, in a region of the nuclear chart where shape coexistence is predicted to exist.

[1] N. Margineăn *et al.*, Eur. Phys. J. A **46** (2010) 329–336.
[2] D. Bucurescu *et al.*, NIM A **837** (2016) 1–10.
[3] T. Beck *et al.*, NIM A **951** (2020) 163090.
[4] A. Martinou *et al.*, Eur. Phys. J. A **57** (2021) 84.

*The authors are thankful to the staff of the 9 MV Tandem Laboratory at Horia Hulubei National Institute of Physics and Nuclear Engineering for both their scientific and technical support during the experiment.