

Manuscript Title:

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Abstract

I. INTRODUCTION

Triaxiality in nuclear systems represented a great challenge over the last decades for the Nuclear Physics community due to its elusive character, however, a tremendous progress has been made in the recent years, both theoretically and experimentally. Regarding its fingerprints, it is a widely known and accepted fact that the phenomenon of *Wobbling Motion* (WM) is a clear signature for triaxial shapes across the chart of nuclides.

Although it was firstly predicted theoretically for even-even nuclei [1], this collective mode has been discovered and confirmed experimentally in several even-odd nuclei, with ^{163}Lu being considered the best *wobbler*, mainly due to its relatively rich spectrum in terms of wobbling bands (with four triaxial super-deformed bands TSD1,2,3, and 4, with TSD1 as the ground state - yrast - band and three wobbling excitations).

II. THEORETICAL FRAMEWORK

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- [1] A. Bohr and B. R. Mottelson, *Nuclear structure*, Vol. 1 (World Scientific, 1998).

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