Investigating α-Decay Processes with Position-Dependent Effective Mass

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This study explores α-decay processes, building upon the foundational work of Gamow and subsequent advancements in quantum mechanics. Addressing discrepancies in branching ratio predictions, the research emphasizes the need for refined models to accurately depict these hindered decays. The study utilizes various theoretical frameworks, including the semiclassical Wentzel-Kramers-Brillouin (WKB) method [1, 2] and an approach integrating position-dependent mass (PDM) [3]. Through the deformed Schrdinger equation [4], the research aims to improve the understanding and calculation of α-decay half-lives of some nuclei. The findings, presented and discussed, provide significant theoretical and experimental insights into the α-decay landscape, underscoring the implications of PDM.

References

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