Microgravity Science and Experiments (6)
Microgravity Science and Experiments - IP Session (IP)

Author: Mr. Amrit Roy
other, India

Ms. Aayusha Singh
other, India
Mr. Om Singh
India

INVESTIGATING THE BEHAVIOR OF DARK MATTER-ANALOGOUS PARTICLES IN MICRO-GRAVITY ENVIRONMENTS: A HYPOTHETICAL STUDY

Abstract

Exploring dark matter through the behavior of dark matter-like particles, such as axions and Weakly Interacting Massive Particles (WIMPs), under microgravity conditions offers a novel approach, which this paper seeks to present. High-energy particle collisions and astrophysical observations serve as the foundation for existing dark matter research; however, microgravity provides a primarily unexplored field where it might be possible to uncover the intricate interactions between baryonic matter and dark matter particles. Microgravity environments, such as the International Space Station (ISS), could reveal information that would be undetectable under Earth's gravitational constraints by reducing gravitational interference. According to the hypothesis proposed in this study, microgravity would intensify any weak interactions that may exist between these particles and baryonic matter, demonstrating observable deviations from particle trajectories or energy shifts. To mitigate gravitational effects, the proposed experimental design combines strict control measures with advanced detection devices capable of recording these interactions. This research aims to expand dark matter studies by adding a new dimension to existing models, potentially unlocking key insights into one of the universe's most enigmatic constituents.

Keywords

Microgravity, Dark Matter, Particle Interactions, Axions, Weakly Interacting Massive Particles (WIMPs), Gravitational Influence.