Plasma Dynamics in Magnetic Confinement Fusion Devices

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Abstract. The article explores the complex dynamics of plasma in magnetic confinement fusion devices. By employing advanced diagnostics and simulation tools, the study sheds light on plasma behavior under various magnetic field configurations. The research findings enhance our understanding of confinement mechanisms and stability, contributing to the development of future fusion reactors with improved performance and efficiency.

Keywords: Plasma Dynamics, Magnetic Confinement, Fusion Devices, Nuclear Fusion, Energy Solutions

Introduction

Magnetic confinement fusion devices represent a promising approach to achieving sustainable nuclear fusion, offering a potential solution to the global energy crisis. Understanding plasma dynamics within these devices is crucial for optimizing performance and ensuring stability. This article investigates the behavior of plasma in magnetic confinement systems, utilizing cutting-edge diagnostics and simulation technologies. Our research explores various magnetic field configurations and their effects on plasma stability and confinement. The insights gained from this study are expected to guide the design of next-generation fusion reactors, enhancing their efficiency and performance.

References

1. Boynazarov, T., Ryu, D. H., Cho, A. Y., Abbas, H., & Choi, T. (2025). Flexible Hf0. 5Zr0. 5O2/La0. 7Sr0. 3MnO3 Heterostructure by Water-Etching Transfer for Tunable Multilevel RRAM in Neuromorphic Computing. Journal of Alloys and Compounds, 184383.