ID de aportación : **21** Tipo: **Poster**

Impact of Resistivity on the Kruskal-Schwarzschild Instability and Magnetic Reconnection in Relativistic Striped Winds

miércoles, 13 de noviembre de 2024 11:10 (20 actas)

Abstract

The Kruskal-Schwarzschild instability in relativistic striped winds is a key mechanism in magnetized outflows, such as those observed in gamma-ray bursts and active galactic nuclei. Previous studies have investigated the magnetic reconnection driven by this instability without accounting for resistivity. In this study, we extend these investigations by incorporating resistivity into two-dimensional relativistic magnetohydrodynamic (RMHD) simulations to explore how it impacts both the growth of the instability and the dynamics of magnetic reconnection.

Our simulations use various values of resistivity to analyze how it affects the dissipation of magnetic energy over time. Preliminary results show that higher resistivity accelerates the rate of magnetic energy dissipation, suggesting more efficient magnetic reconnection. In contrast, lower resistivity values result in slower energy dissipation, and the evolution appears more gradual. Interestingly, intermediate resistivity values display oscillations in the dissipation rate, potentially indicating additional instabilities or effects that require further investigation.

These findings suggest that resistivity could play an important role in the overall evolution of the Kruskal-Schwarzschild instability, influencing the timescale and efficiency of magnetic reconnection. However, further analysis is needed to fully understand the implications of these effects on the dynamics of the instability, especially regarding how resistivity might interact with other physical processes within the striped wind structure.

In conclusion, while resistivity appears to enhance the efficiency of magnetic reconnection in our simulations, further investigation is necessary to clarify its full impact on the Kruskal-Schwarzschild instability in relativistic outflows. These results contribute to a deeper understanding of how magnetic energy dissipation occurs in highly magnetized astrophysical environments.

Nivel de formación

Pregrado

Autor primario: BAMBAGUE, David (Universidad Nacional De Colombia)

Presentador: BAMBAGUE, David (Universidad Nacional De Colombia)

Clasificación de la sesión: Charlas Paralela II