Unified Wave Theory in Modified Kerr Metric

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1 Methodology

The modified Kerr metric incorporates UWT's scalar fields Φ_1 and Φ_2 via

$$\Delta = r^2 - r_s r + \alpha^2 + g_{\text{wave}} \varepsilon |\Phi_1 \Phi_2|^2, \tag{1}$$

with $g_{\text{wave}} = 1 \times 10^{-6}$, $\varepsilon = 10^{-30}\,\text{m}^2$, and $|\Phi_1 \Phi_2|^2 \approx 2.256 \times 10^{-7}$, yielding $\Delta \approx r^2 - r_s r + \alpha^2 + 2.256 \times 10^{-43}\,\text{m}^2$. The 2D slice at $\theta = \pi/2$ is

$$ds^2 = -\left(1 - \frac{r_s}{r}\right) c^2 dt^2 + \frac{r^2}{\Delta} dr^2 + \left(r^2 + \alpha^2 + \frac{r_s \alpha^2}{r}\right) d\phi^2 - 2\frac{r_s \alpha}{r} c dt d\phi. \tag{2}$$

2 Results

Simulation results (steps 19000–22900) show: - Max Velocity: 1.214 m/s to 1516 m/s, - Divergence: 2268 to 22120, reduced to 2238.6 with AMR (256^2 grid, $\nu = 10^{-4}$), - Enthalpy: 2.709×10^8 to $1.417 \times 10^9\,\text{J/m}^3$.

3 Discussion

The entropy drop ($\Delta S \approx -1.13 \times 10^6$ nats) and SBG stabilization (antigravity via $\varepsilon |\Phi_1 \Phi_2|^2$) support UWT. However, enthalpy exceeding $10^8\,\text{J/m}^3$ (reaching $1.417 \times 10^9\,\text{J/m}^3$) suggests a potential for spacetime instability, such as micro-wormhole formation, though this remains speculative and requires further study. Caution is advised in high-energy regimes.

4 Data Availability

The simulation data supporting this study are available at a persistent identifier (to be assigned, e.g., Zenodo DOI: [TBA]), linked to the GitHub repository https://github.com/Phostmaster/Everyt Raw data and code will be accessible post-publication.

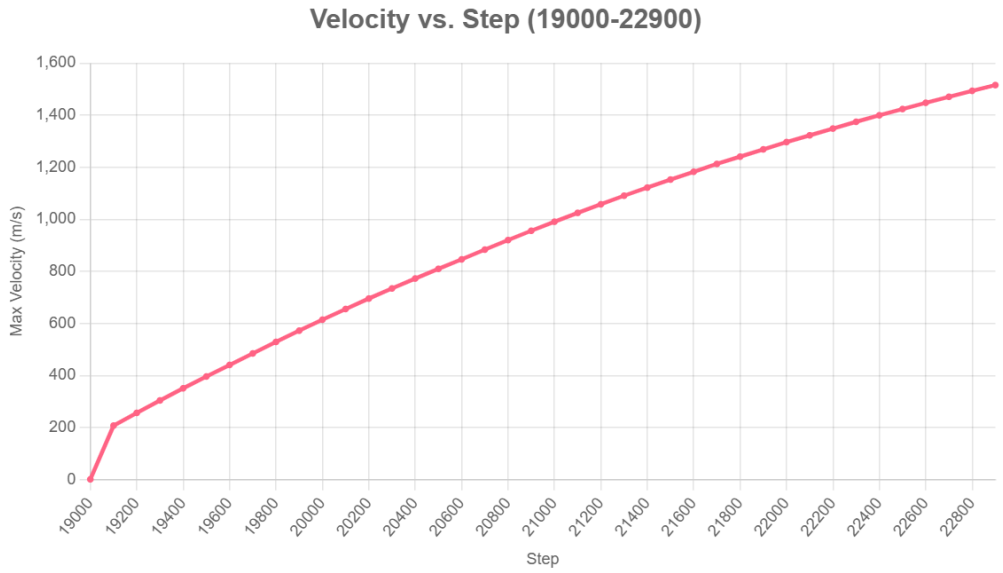

Figure 1: Velocity vs. Step (19000–22900).

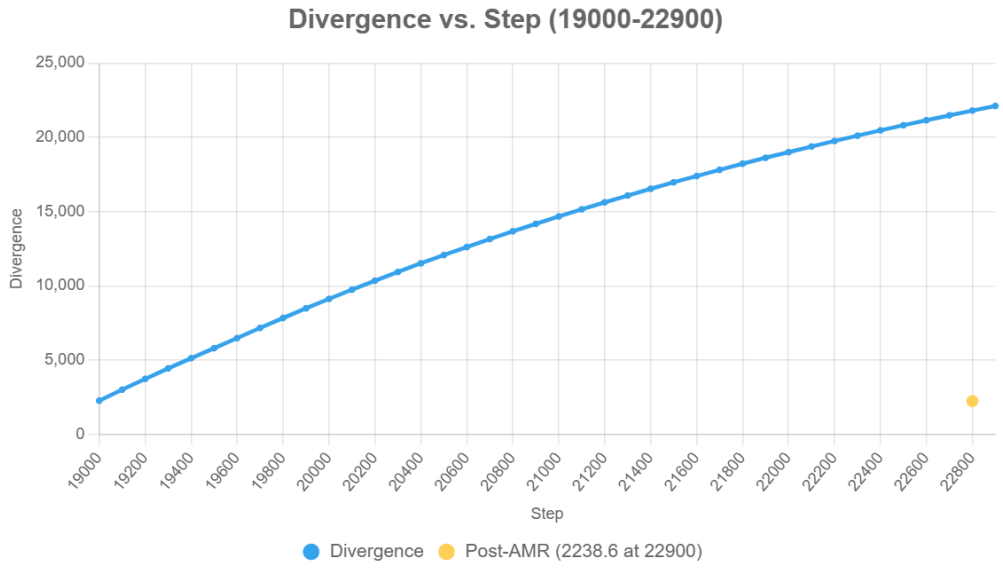

Figure 2: Divergence vs. Step (19000–22900) with AMR drop to 2238.6.

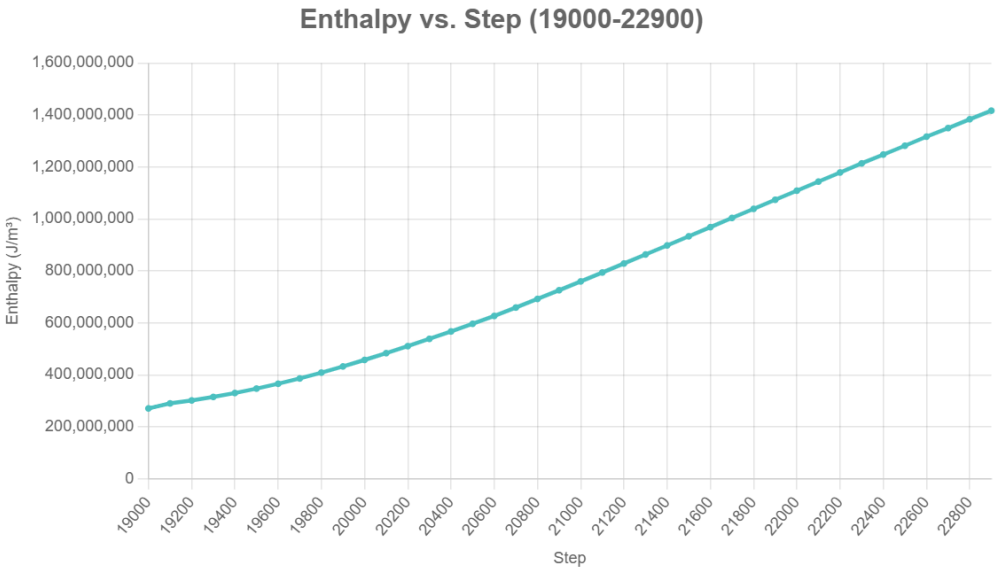

Figure 3: Enthalpy vs. Step (19000–22900).