6 SUPPLEMENTARY TABLES AND FIGURES

6.1 Parallel to large-scale field slice visualisation

In Figure 11 we show a slice through the same dataset as in Figure 1, but for the slice plane parallel to the large-scale field. The direction of the field is shown in the upper-left panel of the plot. This slice orientation reveals the same correlation as in Figure 1, i.e., the gas density and Alfvén velocity in low- \mathcal{M}_{A0} simulations are strongly correlated with each other, and the magnetic field and Alfvén velocity are in the high- \mathcal{M}_{A0} simulations. More evident in this slice orientation is the formation of strong shocked gas traveling along the large-scale field, clearly responsible for creating strong fluctuations in both the density and Alfvén velocity at low- \mathcal{M}_{A0} .

6.2 Numerical Convergence

In Figure 12 we show numerical convergence tests for the two main statistics presented in this study: the variance of the logarithmic gas density (left), and the variance of the logarithmic Alfvén velocity magnitudes (right). For these tests, we compute the variances, averaged from $5\tau - 10\tau$, for $N_{\text{cells}} = 18^3$, 36^3 , 72^3 , 144^3 and 288^3 . In the top column we show the $\mathcal{M}_{A0} = 10$ simulation ensemble, and in the



Figure 11. The same as Figure 1 but for a slice parallel to the large-scale field revealing the fluctuations propagating up and down the field. The same correlations between field variables are present as in Figure 1.



Figure 12. Numerical convergence tests for the two main statistics from our study. We show σ_s^2 (left) and $\sigma_{\ln(v_A/v_{A0})}^2$ (right) as a function of the number of grid elements N_{res} that discretize the L^3 simulation domain. N_{res} varies from 18³ to 288³, for the ensemble of $\mathcal{M}_{A0} = 10$ (top row) and $\mathcal{M}_{A0} = 0.1$ (bottom row) simulations, colored by the different \mathcal{M} so that one can distinguish between simulations.

bottom panel the $\mathcal{M}_{A0} = 0.1$ panel, showcasing both super-and-sub-Alfvénic cases. At 288³, which is the grid resolution used in the main text of this study, all of the statistics are well-converged in grid resolution.