Supplement (complete, non-truncated)

This file is generated as part of the reproducibility snapshot. It is intentionally self-contained and points to the archived outputs under **outputs/** and diagnostic bundles under **outputs/diagnostics/**. I write in first-person singular throughout.

A11f Sensitivity-convergence (complete)

Goal: demonstrate that the reported finite-difference sensitivities S_M, S_R, S_Λ are stable against the $\Delta\sigma$ span used for the slope estimate, and that any residual spread is propagated into uncertainty bands.

1　Grid of $\Delta\sigma$ spans: $\Delta\sigma \in \{0.02, 0.04, 0.06\}$ (dimensionless σ units as defined in CONVENTIONS.md).
2　For each EOS and observable $O \in \{M\_max, R\_1.4, \Lambda\_1.4\}$, compute $S\_O(\Delta\sigma)$ via centered differences and record min/max and standard deviation across spans.
3　Report sensitivities with error bars: S_O = mean ± std (and include min/max columns).
4　If nonlinearity is detected (quadratic term significant), use a quadratic fit in σ for propagation and report the fitted coefficients and R^2.

Outliers and extreme discretization uncertainty

Several rows can show δ_disc or $\delta\_total > 100\%$ (e.g., $\Lambda\_1.4$ for WFF1 in coarse grids). I treat these as **pathological numerical cases** until convergence evidence says otherwise. I therefore:

- Exclude any run with $\delta\_total > 100\%$ from headline summary statistics (main-text tables) and report it only in the Supplement with a prominent footnote.
- Attach a diagnostic bundle for each such case under outputs/diagnostics/_/ containing: Richardson plot, Newton residual trace, WFaktor profile, and the run log.
- If extended refinement ($n \geq 16384/32768$) is feasible, I re-run and update δ_disc; if not, I document the computational limit and keep the error conservative.

Variant B: physical scope and double-counting caveat

Variant B is retained only as an explicit sensitivity check. I make the accounting explicit: in Variant B I add the same $\sigma\chi$-induced correction both (i) to the inertial combination ($\varepsilon+P$) and (ii) to the gravitational source dm/dr. This can double-count if the effective term already represents a reparameterization of gravitational mass-energy. I therefore never use Variant B for headline claims and I flag any Variant-B-only qualitative changes as non-robust.

Glossary and WFaktor diagnostic (compact)

I include a compact glossary and WFaktor definition in the repository under supplement/Glossary.md and supplement/WFaktor.md, and I index diagnostic artefacts in supplement/diagnostics_index.md.

Appendix: where to find the artefacts

- outputs/summary_canonical_runs.csv (headline observables)
- outputs/uncertainty_budget_components.csv (δ_disc, δ_match, δ_stat components)
- outputs/diagnostics/* (outlier bundles)
- outputs/sensitivity_convergence/* ($\Delta\sigma$ scans)
- outputs/wfaktor_summary.csv (WFaktor batch output; generated by scripts/wfaktor_batch.py)