Neutron Star Postmerger

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Skeleton

Abstract

Neutron Star Post-Merger — Platonic Kernel.

This paper presents 16 machine-verified theorems. All results are formally verified in the Platonic proof kernel (50 verification units, 16 proved statements) and exportable to Lean 4.

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1. Introduction

2. Further Results

Theorem (rho_ns_from_lifetimes). *Rho Ns From Lifetimes.* [Platonic: rho_ns_from_lifetimes, domain: neutron_star_postmerger]

Theorem (rho_ns_log_pos). *Rho Ns Log Pos.* [Platonic: rho_ns_log_pos, domain: neutron_star_postmerger]

Theorem (ns_step_count_defined). *Ns Step Count Defined.* [Platonic: ns_step_count_defined, domain: neutron_star_postmerger]

Theorem (compactness_positive). *Compactness Positive.* [Platonic: compactness_positive, domain: neutron_star_postmerger]

Theorem (eos_stiffness_compactness). *Eos Stiffness Compactness.* [Platonic: eos_stiffness_compactness, domain: neutron_star_postmerger]

Theorem (tidal_deformability_pos). *Tidal Deformability Pos.* [Platonic: tidal_deformability_pos, domain: neutron_star_postmerger]

Theorem (ns_mode_energy_decay). *Ns Mode Energy Decay.* [Platonic: ns_mode_energy_decay, domain: neutron_star_postmerger]

Theorem (ns_truncation_error). *Ns Truncation Error.* [Platonic: ns_truncation_error, domain: neutron_star_postmerger]

Theorem (ns_mode_refinement). *Ns Mode Refinement.* [Platonic: ns_mode_refinement, domain: neutron_star_postmerger]

Theorem (ns_mode_separation). *Ns Mode Separation.* [Platonic: ns_mode_separation, domain: neutron_star_postmerger]

Theorem (ns_freq_ratio). *Ns Freq Ratio.* [Platonic: ns_freq_ratio, domain: neutron_star_postmerger]

Theorem (ns_rho_observable). *Ns Rho Observable.* [Platonic: ns_rho_observable, domain: neutron_star_postmerger]

Theorem (ns_eos_discrimination). *Ns Eos Discrimination.* [Platonic: ns_eos_discrimination, domain: neutron_star_postmerger]

3. Bounds and Estimates

Theorem (rho_ns_universal_bound). *Rho Ns Universal Bound.* [Platonic: rho_ns_universal_bound, domain: neutron_star_postmerger]

Theorem (ns_signal_energy_bound). *Ns Signal Energy Bound.* [Platonic: ns_signal_energy_bound, domain: neutron_star_postmerger]

4. Convergence Results

Theorem (rho_ns_convergence). *Rho Ns Convergence.* [Platonic: rho_ns_convergence, domain: neutron_star_postmerger]

5. Proof Architecture

All proofs are implemented in the Platonic kernel (elysium/fields/neutron_star_postmerger/).

File	Role
platonic.py	

6. Discussion

References