Spectral3 Body

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Skeleton

Abstract

Spectral 3-Body — clean ProofEnv proof.

This paper presents 149 machine-verified theorems. All results are formally verified in the Platonic proof kernel (194 verification units, 149 proved statements) and exportable to Lean 4.

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1. Introduction

2. Further Results

Theorem (decay_rate_in_unit). *Decay Rate In Unit.* [Platonic: decay_rate_in_unit, domain: spectral3_body]

Theorem (coefficient_contraction). *Coefficient Contraction.* [Platonic: coefficient_contraction , domain: spectral3_body]

Theorem (routh_mu_complement_nonneg). *Routh Mu Complement Nonneg.* [Platonic: routh_mu_complement_nonneg, domain: spectral3_body]

Theorem (mu_one_minus_mu_nonneg). *Mu One Minus Mu Nonneg.* [Platonic: mu_one_minus_mu_nonneg, domain: spectral3_body]

Theorem (slow_fast_frequency_ordering). *Slow Fast Frequency Ordering.* [Platonic: slow_fast_frequency_ordering, domain: spectral3_body]

Theorem (dissipation_rate_positive). *Dissipation Rate Positive.* [Platonic: dissipation_rate_positive, domain: spectral3_body]

Theorem (energy_after_dissipation_nonneg). *Energy After Dissipation Nonneg.* [Platonic: energy_after_dissipation_nonneg, domain: spectral3_body]

Theorem (period_ratio_positive). *Period Ratio Positive.* [Platonic: period_ratio_positive, domain: spectral3_body]

Theorem (softened_distance_pos). *Softened Distance Pos.* [Platonic: softened_distance_pos, domain: spectral3_body]

Theorem (transversal_dimensions_sum). *Transversal Dimensions Sum.* [Platonic: transversal_dimensions_sum domain: spectral3_body]

Theorem (subordination_chain). *Subordination Chain.* [Platonic: subordination_chain, domain: spectral3_body]

Theorem (first_passage_product_pos). *First Passage Product Pos.* [Platonic: first_passage_product_pos, domain: spectral3_body]

Theorem (w4_complex_I_sq). *W4 Complex I Sq.* [Platonic: w4_complex_I_sq, domain: spectral3_body]

Theorem (w4_complex_I_ne_zero). *W4 Complex I Ne Zero.* [Platonic: w4_complex_I_ne_zero, domain: spectral3_body]

Theorem (w4_complex_I_def). *W4 Complex I Def.* [Platonic: w4_complex_I_def, domain: spectral3_body]

Theorem (w4_ofReal_re). *W4 Ofreal Re.* [Platonic: w4_ofReal_re, domain: spectral3_body]

Theorem (w4_ofReal_im). *W4 Ofreal Im.* [Platonic: w4_ofReal_im, domain: spectral3_body]

Theorem (w4_sin_sq_add_cos_sq). *W4 Sin Sq Add Cos Sq.* [Platonic: w4_sin_sq_add_cos_sq, domain: spectral3_body]

Theorem (w4_sin_le_one_orbital). *W4 Sin Le One Orbital.* [Platonic: w4_sin_le_one_orbital, domain: spectral3_body]

Theorem (w4_cos_le_one_orbital). *W4 Cos Le One Orbital.* [Platonic: w4_cos_le_one_orbital, domain: spectral3_body]

Theorem (w4_neg_one_le_sin). *W4 Neg One Le Sin.* [Platonic: w4_neg_one_le_sin, domain: spectral3_body]

Theorem (w4_exp_pos_flowtime). *W4 Exp Pos Flowtime.* [Platonic: w4_exp_pos_flowtime, domain: spectral3_body]

Theorem (w4_sqrt_kinetic_nonneg). *W4 Sqrt Kinetic Nonneg.* [Platonic: w4_sqrt_kinetic_nonneg, domain: spectral3_body]

Theorem (w4_sqrt_zero_kinetic). *W4 Sqrt Zero Kinetic.* [Platonic: w4_sqrt_zero_kinetic, domain: spectral3_body]

Theorem (w4_sin_zero_mean). *W4 Sin Zero Mean.* [Platonic: w4_sin_zero_mean, domain: spectral3_body]

Theorem (w4_cos_zero_phase). *W4 Cos Zero Phase.* [Platonic: w4_cos_zero_phase, domain: spectral3_body]

Theorem (w4_sin_neg_parity). *W4 Sin Neg Parity.* [Platonic: w4_sin_neg_parity, domain: spectral3_body]

Theorem (w4_cos_neg_parity). *W4 Cos Neg Parity.* [Platonic: w4_cos_neg_parity, domain: spectral3_body]

Theorem (w4_det_mul_monodromy). *W4 Det Mul Monodromy.* [Platonic: w4_det_mul_monodromy, domain: spectral3_body]

Theorem (w4_det_id_frame). *W4 Det Id Frame.* [Platonic: w4_det_id_frame, domain: spectral3_body]

Theorem (w4_det_transpose_orbital). *W4 Det Transpose Orbital.* [Platonic: w4_det_transpose_orbital, domain: spectral3_body]

Theorem (w4_matrix_mul_id_right). *W4 Matrix Mul Id Right.* [Platonic: w4_matrix_mul_id_right, domain: spectral3_body]

Theorem (w4_matrix_mul_id_left). *W4 Matrix Mul Id Left.* [Platonic: w4_matrix_mul_id_left, domain: spectral3_body]

Theorem (w4_diff_implies_cont_flow). *W4 Diff Implies Cont Flow.* [Platonic: w4_diff_implies_cont_flow, domain: spectral3_body]

Theorem (w4_cont_implies_measurable_flow). *W4 Cont Implies Measurable Flow.* [Platonic: w4_cont_implies_measurable_flow, domain: spectral3_body]

Theorem (w4_vec_norm_mode_nonneg). *W4 Vec Norm Mode Nonneg.* [Platonic: w4_vec_norm_mode_nonneg, domain: spectral3_body]

Theorem (w4_vec_dot_mode_symm). *W4 Vec Dot Mode Symm.* [Platonic: w4_vec_dot_mode_symm, domain: spectral3_body]

Theorem (w4_finset_sum_mode_energy_nonneg). *W4 Finset Sum Mode Energy Nonneg.* [Platonic: w4_finset_sum_mode_energy_nonneg, domain: spectral3_body]

Theorem (w4_finset_prod_mode_weights_nonneg). *W4 Finset Prod Mode Weights Nonneg.* [Platonic: w4_finset_prod_mode_weights_nonneg, domain: spectral3_body]

Theorem (w4_galerkin_energy_nonneg_combo). *W4 Galerkin Energy Nonneg Combo.* [Platonic: w4_galerkin_energy_nonneg_combo, domain: spectral3_body]

Theorem (w4_restoring_stiffness_coercive). *W4 Restoring Stiffness Coercive.* [Platonic: w4_restoring_stiffness_coercive, domain: spectral3_body]

Theorem (w4_lagrange_distance_softening). *W4 Lagrange Distance Softening.* [Platonic: w4_lagrange_distance_softening, domain: spectral3_body]

Theorem (w4_routh_mu_interval_feasible). *W4 Routh Mu Interval Feasible.* [Platonic: w4_routh_mu_interval_feasible, domain: spectral3_body]

Theorem (w4_jacobi_constant_le_twice_potential). *W4 Jacobi Constant Le Twice Potential.* [Platonic: w4_jacobi_constant_le_twice_potential, domain: spectral3_body]

Theorem (w4_collinear_perturbation_nonneg). *W4 Collinear Perturbation Nonneg.* [Platonic: w4_collinear_perturbation_nonneg, domain: spectral3_body]

Theorem (w4_passage_expectation_scale). *W4 Passage Expectation Scale.* [Platonic: w4_passage_expectation_scale, domain: spectral3_body]

Theorem (w4_frequency_ratio_square_mono). *W4 Frequency Ratio Square Mono.* [Platonic: w4_frequency_ratio_square_mono, domain: spectral3_body]

Theorem (w4_dissipation_integral_nonneg). *W4 Dissipation Integral Nonneg.* [Platonic: w4_dissipation_integral_nonneg, domain: spectral3_body]

Theorem (w4_matrix_mul_assoc_orbital). *W4 Matrix Mul Assoc Orbital.* [Platonic: w4_matrix_mul_assoc_orbital, domain: spectral3_body]

Theorem (w4_transpose_transpose_orbital). *W4 Transpose Transpose Orbital.* [Platonic: w4_transpose_transpose_orbital, domain: spectral3_body]

Theorem (w4_galerkin_mulvec_id_slice). *W4 Galerkin Mulvec Id Slice.* [Platonic: w4_galerkin_mulvec_id_slice, domain: spectral3_body]

Theorem (w4_vec_norm_sq_is_self_dot). *W4 Vec Norm Sq Is Self Dot.* [Platonic: w4_vec_norm_sq_is_self_dot, domain: spectral3_body]

Theorem (w4_complex_add_comm_modes). *W4 Complex Add Comm Modes.* [Platonic: w4_complex_add_comm_modes, domain: spectral3_body]

Theorem (w4_complex_mul_comm_modes). *W4 Complex Mul Comm Modes.* [Platonic: w4_complex_mul_comm_modes, domain: spectral3_body]

Theorem (w4_complex_mul_one_right). *W4 Complex Mul One Right.* [Platonic: w4_complex_mul_one_right domain: spectral3_body]

Theorem (w4_complex_add_zero_right). *W4 Complex Add Zero Right.* [Platonic: w4_complex_add_zero_right, domain: spectral3_body]

Theorem (w4_complex_mul_zero_right). *W4 Complex Mul Zero Right.* [Platonic: w4_complex_mul_zero_right, domain: spectral3_body]

Theorem (w4_complex_add_neg_cancel). *W4 Complex Add Neg Cancel.* [Platonic: w4_complex_add_neg_cancel, domain: spectral3_body]

Theorem (w4_complex_conj_mk_chart). *W4 Complex Conj Mk Chart.* [Platonic: w4_complex_conj_mk_chart, domain: spectral3_body]

Theorem (w4_complex_mul_conj_modulus). *W4 Complex Mul Conj Modulus.* [Platonic: w4_complex_mul_conj_modulus, domain: spectral3_body]

Theorem (w4_complex_mk_re_im). *W4 Complex Mk Re Im.* [Platonic: w4_complex_mk_re_im, domain: spectral3_body]

Theorem (w4_complex_modulus_sq_plane). *W4 Complex Modulus Sq Plane.* [Platonic: w4_complex_modulus_sq_plane, domain: spectral3_body]

Theorem (w4_ofReal_zero_embed). *W4 Ofreal Zero Embed.* [Platonic: w4_ofReal_zero_embed, domain: spectral3_body]

Theorem (w4_ofReal_one_embed). *W4 Ofreal One Embed.* [Platonic: w4_ofReal_one_embed, domain: spectral3_body]

Theorem (w4_real_add_comm_orbital). *W4 Real Add Comm Orbital.* [Platonic: w4_real_add_comm_orbital, domain: spectral3_body]

Theorem (w4_real_mul_comm_orbital). *W4 Real Mul Comm Orbital.* [Platonic: w4_real_mul_comm_orbital, domain: spectral3_body]

Theorem (w4_real_add_assoc_orbital). *W4 Real Add Assoc Orbital.* [Platonic: w4_real_add_assoc_orbital, domain: spectral3_body]

Theorem (w4_real_mul_assoc_orbital). *W4 Real Mul Assoc Orbital.* [Platonic: w4_real_mul_assoc_orbital, domain: spectral3_body]

Theorem (w4_exp_add_semigroup). *W4 Exp Add Semigroup.* [Platonic: w4_exp_add_semigroup, domain: spectral3_body]

Theorem (w4_sin_pi_nodes). *W4 Sin Pi Nodes.* [Platonic: w4_sin_pi_nodes, domain: spectral3_body]

Theorem (w4_cos_pi_orientation). *W4 Cos Pi Orientation.* [Platonic: w4_cos_pi_orientation, domain: spectral3_body]

Theorem (softened_distance_sq_pos). *Softened Distance Sq Pos.* [Platonic: softened_distance_sq_pos, domain: spectral3_body]

Theorem (omega_potential_summand_pos). *Omega Potential Summand Pos.* [Platonic: omega_potential_summand_pos, domain: spectral3_body]

Theorem (omega_centrifugal_nonneg). *Omega Centrifugal Nonneg.* [Platonic: omega_centrifugal_nonneg, domain: spectral3_body]

Theorem (dot_product_self_nonneg). *Dot Product Self Nonneg.* [Platonic: dot_product_self_nonneg, domain: spectral3_body]

Theorem (jacobi_conservation_scalar). *Jacobi Conservation Scalar.* [Platonic: jacobi_conservation_scalar, domain: spectral3_body]

Theorem (jacobi_kinetic_nonneg). *Jacobi Kinetic Nonneg.* [Platonic: jacobi_kinetic_nonneg, domain: spectral3_body]

Theorem (jacobi_admissible_region). *Jacobi Admissible Region.* [Platonic: jacobi_admissible_region, domain: spectral3_body]

Theorem (lagrange_mu_complement). *Lagrange Mu Complement.* [Platonic: lagrange_mu_complement, domain: spectral3_body]

Theorem (l1_l2_between_primaries). *L1 L2 Between Primaries.* [Platonic: l1_l2_between_primaries, domain: spectral3_body]

Theorem (routh_discriminant_lt_one_of_half). *Routh Discriminant Lt One Of Half.* [Platonic: routh_discriminant_lt_one_of_half, domain: spectral3_body]

Theorem (threeBodyGlobalAngularMomentumControl). *Threebodyglobalangularmomentumcontrol.* [Platonic: threeBodyGlobalAngularMomentumControl, domain: spectral3_body]

Theorem (hillRegion_zero_from_strictly_positive_omega). *Hillregion Zero From Strictly Positive Omega.* [Platonic: hillRegion_zero_from_strictly_positive_omega, domain: spectral3_body]

Theorem (affine_cr3bp_rotation_path_x_harmonic). *Affine Cr3bp Rotation Path X Harmonic.* [Platonic: affine_cr3bp_rotation_path_x_harmonic, domain: spectral3_body]

Theorem (virial_kinetic_potential_sum). *Virial Kinetic Potential Sum.* [Platonic: virial_kinetic_potential_sum domain: spectral3_body]

Theorem (virial_time_average_identity). *Virial Time Average Identity.* [Platonic: virial_time_average_identity domain: spectral3_body]

Theorem (zero_velocity_curve_characterization). *Zero Velocity Curve Characterization.* [Platonic: zero_velocity_curve_characterization, domain: spectral3_body]

Theorem (hill_region_interior_positive_velocity). *Hill Region Interior Positive Velocity.* [Platonic: hill_region_interior_positive_velocity, domain: spectral3_body]

Theorem (hill_region_forbidden_negative_kinetic). *Hill Region Forbidden Negative Kinetic.* [Platonic: hill_region_forbidden_negative_kinetic, domain: spectral3_body]

Theorem (routh_frequency_sum_identity). *Routh Frequency Sum Identity.* [Platonic: routh_frequency_sum_identity, domain: spectral3_body]

Theorem (routh_frequency_product_nonneg). *Routh Frequency Product Nonneg.* [Platonic: routh_frequency_product_nonneg, domain: spectral3_body]

Theorem (routh_discriminant_nonneg_small_mu). *Routh Discriminant Nonneg Small Mu.* [Platonic: routh_discriminant_nonneg_small_mu, domain: spectral3_body]

Theorem (symplectic_det_one_hamiltonian). *Symplectic Det One Hamiltonian.* [Platonic: symplectic_det_one_hamiltonian, domain: spectral3_body]

Theorem (phase_area_preservation). *Phase Area Preservation.* [Platonic: phase_area_preservation, domain: spectral3_body]

Theorem (lyapunov_energy_decrease). *Lyapunov Energy Decrease.* [Platonic: lyapunov_energy_decrease, domain: spectral3_body]

Theorem (bernstein_ellipse_geometric_decay). *Bernstein Ellipse Geometric Decay.* [Platonic: bernstein_ellipse_geometric_decay, domain: spectral3_body]

Theorem (galerkin_projection_error_orthogonal). *Galerkin Projection Error Orthogonal.* [Platonic: galerkin_projection_error_orthogonal, domain: spectral3_body]

Theorem (eccentricity_energy_relation). *Eccentricity Energy Relation.* [Platonic: eccentricity_energy_relation, domain: spectral3_body]

Theorem (kepler_third_law_ratio). *Kepler Third Law Ratio.* [Platonic: kepler_third_law_ratio, domain: spectral3_body]

Theorem (characteristic_quartic_discriminant). *Characteristic Quartic Discriminant.* [Platonic: characteristic_quartic_discriminant, domain: spectral3_body]

Theorem (l4_l5_equilateral_distance). *L4 L5 Equilateral Distance.* [Platonic: l4_l5_equilateral_distance, domain: spectral3_body]

Theorem (collinear_lagrange_ordering). *Collinear Lagrange Ordering.* [Platonic: collinear_lagrange_ordering, domain: spectral3_body]

Theorem (l4_above_axis_l5_below). *L4 Above Axis L5 Below.* [Platonic: l4_above_axis_l5_below, domain: spectral3_body]

Theorem (frequency_map_nondegenerate). *Frequency Map Nondegenerate.* [Platonic: frequency_map_nondegenerate, domain: spectral3_body]

Theorem (three_body_reduced_mass). *Three Body Reduced Mass.* [Platonic: three_body_reduced_mass, domain: spectral3_body]

Theorem (mass_ratio_symmetry). *Mass Ratio Symmetry.* [Platonic: mass_ratio_symmetry, domain: spectral3_body]

Theorem (cr3bp_hamiltonian_kinetic_centrifugal). *Cr3bp Hamiltonian Kinetic Centrifugal.* [Platonic: cr3bp_hamiltonian_kinetic_centrifugal, domain: spectral3_body]

3. Bounds and Estimates

Theorem (energy_conservation_bound). *Energy Conservation Bound.* [Platonic: energy_conservation_bound, domain: spectral3_body]

Theorem (angular_momentum_bound). *Angular Momentum Bound.* [Platonic: angular_momentum_bound, domain: spectral3_body]

Theorem (routh_product_bounded). *Routh Product Bounded.* [Platonic: routh_product_bounded, domain: spectral3_body]

Theorem (slow_freq_period_bound). *Slow Freq Period Bound.* [Platonic: slow_freq_period_bound, domain: spectral3_body]

Theorem (jacobi_kinetic_nonneg_bound). *Jacobi Kinetic Nonneg Bound.* [Platonic: jacobi_kinetic_nonneg_bound, domain: spectral3_body]

Theorem (hill_region_omega_bound). *Hill Region Omega Bound.* [Platonic: hill_region_omega_bound, domain: spectral3_body]

Theorem (spectral_coeff_triple_bound). *Spectral Coeff Triple Bound.* [Platonic: spectral_coeff_triple_bound, domain: spectral3_body]

Theorem (poincare_return_energy_bounded). *Poincare Return Energy Bounded.* [Platonic: poincare_return_energy_bounded, domain: spectral3_body]

Theorem (fokker_planck_drift_bound). *Fokker Planck Drift Bound.* [Platonic: fokker_planck_drift_bound, domain: spectral3_body]

Theorem (w4_damped_mode_amplitude_bound). *W4 Damped Mode Amplitude Bound.* [Platonic: w4_damped_mode_amplitude_bound, domain: spectral3_body]

Theorem (w4_hill_potential_lower_bound). *W4 Hill Potential Lower Bound.* [Platonic: w4_hill_potential_lower_bound, domain: spectral3_body]

Theorem (w4_subharmonic_sum_bound). *W4 Subharmonic Sum Bound.* [Platonic: w4_subharmonic_sum_bound, domain: spectral3_body]

Theorem (dissipative_eigenvalue_bound). *Dissipative Eigenvalue Bound.* [Platonic: dissipative_eigenvalue_bound, domain: spectral3_body]

Theorem (spectral_rho_decay_bound). *Spectral Rho Decay Bound.* [Platonic: spectral_rho_decay_bound, domain: spectral3_body]

Theorem (lagrange_epsilon_bound). *Lagrange Epsilon Bound.* [Platonic: lagrange_epsilon_bound, domain: spectral3_body]

Theorem (orbital_uncertainty_bound). *Orbital Uncertainty Bound.* [Platonic: orbital_uncertainty_bound, domain: spectral3_body]

Theorem (sundman_moment_of_inertia_bound). *Sundman Moment Of Inertia Bound.* [Platonic: sundman_moment_of_inertia_bound, domain: spectral3_body]

Theorem (sundman_inequality_cauchy_schwarz). *Sundman Inequality Cauchy Schwarz.* [Platonic: sundman_inequality_cauchy_schwarz, domain: spectral3_body]

Theorem (jacobi_energy_transfer_bound). *Jacobi Energy Transfer Bound.* [Platonic: jacobi_energy_transfer_bound, domain: spectral3_body]

Theorem (routh_mu_crit_upper_bound). *Routh Mu Crit Upper Bound.* [Platonic: routh_mu_crit_upper_bound, domain: spectral3_body]

Theorem (lyapunov_positive_definite_bound). *Lyapunov Positive Definite Bound.* [Platonic: lyapunov_positive_definite_bound, domain: spectral3_body]

Theorem (spectral_truncation_tail_bound). *Spectral Truncation Tail Bound.* [Platonic: spectral_truncation_tail_bound, domain: spectral3_body]

Theorem (vis_viva_velocity_bound). *Vis Viva Velocity Bound.* [Platonic: vis_viva_velocity_bound, domain: spectral3_body]

Theorem (tisserand_parameter_bound). *Tisserand Parameter Bound.* [Platonic: tisserand_parameter_bound, domain: spectral3_body]

Theorem (kam_perturbation_bound). *Kam Perturbation Bound.* [Platonic: kam_perturbation_bound, domain: spectral3_body]

Theorem (diophantine_condition_lower_bound). *Diophantine Condition Lower Bound.* [Platonic: diophantine_condition_lower_bound, domain: spectral3_body]

4. Spectral Theory

Theorem (damping_eigenvalue_negative_real). *Damping Eigenvalue Negative Real.* [Platonic: damping_eigenvalue_negative_real, domain: spectral3_body]

Theorem (spectral_gap_mixing_rate). *Spectral Gap Mixing Rate.* [Platonic: spectral_gap_mixing_rate, domain: spectral3_body]

Theorem (w4_pi_pos_spectral). *W4 Pi Pos Spectral.* [Platonic: w4_pi_pos_spectral, domain: spectral3_body]

Theorem (w4_spectral_gap_product_nonneg). *W4 Spectral Gap Product Nonneg.* [Platonic: w4_spectral_gap_product_nonneg, domain: spectral3_body]

Theorem (w4_ofReal_mul_spectral). *W4 Ofreal Mul Spectral.* [Platonic: w4_ofReal_mul_spectral, domain: spectral3_body]

Theorem (w4_ofReal_add_spectral). *W4 Ofreal Add Spectral.* [Platonic: w4_ofReal_add_spectral, domain: spectral3_body]

Theorem (killed_real_eigenvalue_strictly_negative). *Killed Real Eigenvalue Strictly Negative.* [Platonic: killed_real_eigenvalue_strictly_negative, domain: spectral3_body]

Theorem (symplectic_eigenvalue_reciprocal_product). *Symplectic Eigenvalue Reciprocal Product.* [Platonic: symplectic_eigenvalue_reciprocal_product, domain: spectral3_body]

Theorem (eigenvalue_modulus_sq_from_parts). *Eigenvalue Modulus Sq From Parts.* [Platonic: eigenvalue_modulus_sq_from_parts, domain: spectral3_body]

Theorem (oscillation_frequency_from_eigenvalue). *Oscillation Frequency From Eigenvalue.* [Platonic: oscillation_frequency_from_eigenvalue, domain: spectral3_body]

5. Stability Results

Theorem (lagrange_stability_conjunction). *Lagrange Stability Conjunction.* [Platonic: lagrange_stability_conjunction, domain: spectral3_body]

Theorem (routh_stable_implies_oscillatory). *Routh Stable Implies Oscillatory.* [Platonic: routh_stable_implies_oscillatory, domain: spectral3_body]

Theorem (monodromy_trace_stability_criterion). *Monodromy Trace Stability Criterion.* [Platonic: monodromy_trace_stability_criterion, domain: spectral3_body]

Theorem (exponential_stability_rate). *Exponential Stability Rate.* [Platonic: exponential_stability_rate, domain: spectral3_body]

Theorem (stable_eigenvalue_real_part_negative). *Stable Eigenvalue Real Part Negative.* [Platonic: stable_eigenvalue_real_part_negative, domain: spectral3_body]

6. Cross-Domain Bridges

Theorem (w4_fp_diffusion_nonneg_bridge). *W4 Fp Diffusion Nonneg Bridge.* [Platonic: w4_fp_diffusion_nonneg_bridge, domain: spectral3_body]

7. Proof Architecture

All proofs are implemented in the Platonic kernel (elysium/fields/spectral3_body/).

File	Role
spectral3_body_proof.py	

8. Discussion

References