

A Common-Mode Shield for Live Admission in Delayed Open Priority Networks

Addendum to Translation-Equivariant Disturbance Recovery in Delayed Open Priority Networks

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Abstract

A standard live admission can pull every incumbent by a distance proportional to a newcomer's initial separation, despite physical continuity at the event. We give a separate admission law that projects the complete residual table onto incumbent-centered and newcomer-tracking components. The newcomer's physical residual cancels exactly from incumbent feedback while its priority row participates in the actual delayed network. Under the parent paper's coherent-history and small-age assumptions, incumbent common translation obeys its pre-admission free-mode equation, the newcomer approaches the prescribed offset geometry, and a later history-gated switch recovers the ordinary full-cohort dynamics. The incumbent displacement and final common-mode seam have bounds independent of the newcomer's initial absolute distance, although capture time and newcomer actuation do not. We retain the parent disturbance-recovery theorem and the existing membership and delayed-priority results as dependencies, rather than reproving them.

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1 Problem and source frame

The parent article [1] uses fixed offsets r_i , priority goals q_i , and a translation-equivariant residual decoder. At an admission, surviving position and velocity are retained, but the full-cohort centroid changes. This is enough to defeat a distance-independent incumbent displacement claim. Priority membership itself is governed by the positive join map of [2]; its Theorem 4.1 concerns a later round trip and does not promise live spatial stability. Delayed priority endpoints depend on initialized history and the actual schedule, as made explicit in [3]. The present result changes only the admission-phase nominal controller and its later switch. It does not assert restoration of a former priority endpoint or revise the parent recovery theorem.

All claims concern exact nominal double integrators. A fixed objective anchor table and physical offsets are bounded independently of the newcomer's starting position. Actual packet/history, cohort, gain, disturbance and switching premises are stated below. No collision, radio reachability, actuator, rigid-body or publication claim follows.

2 A no-go result for ordinary immediate centering

Proposition 1 (Distance-dependent incumbent translation). *For any $n \geq 1$, the parent's ordinary full-cohort decoder applied immediately after one admission admits zero-disturbance, equal-goal executions in which each incumbent's limiting displacement is $R/(n+1)$, where R is the newcomer's initial distance from the incumbent offset formation. Thus no incumbent displacement bound independent of R follows from ordinary full-cohort centering alone.*

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Proof. Take every incumbent offset-corrected position $p_i = x_i - r_i = 0$, newcomer $p_j = Ru$ for a unit vector u , and all initial velocities zero. Take common constant goals and zero disturbances. The new full-cohort mean is $Ru/(n+1)$ and, by the parent's centered-error identity, obeys the unforced damped mean law. It is therefore constant. Under the parent's admissible small-age and coherent-history conditions, the relative modes converge to zero. Hence each p_i converges to $Ru/(n+1)$. Zero delay is already a member of the admissible class. Bounded delay cannot remove this exact mean invariant. $\square$

The result does not contradict the parent's theorem: that theorem explicitly permits the cohort mean to change when membership changes.

Proposition 2 (Endpoint compatibility does not control the transient). *Suppose the old and new coherent controllers have zero mean restoring error and no common disturbance after the event. Put $\zeta_{\mathcal{I}} = \xi_{\mathcal{I}} + \dot{\xi}_{\mathcal{I}}/C$. At the admission,*

$$\zeta_+ = \frac{n\zeta_{\mathcal{I}} + p_j + v_j/C}{n+1}; \quad \zeta_+ = \zeta_{\mathcal{I}} \iff p_j + v_j/C = \zeta_{\mathcal{I}}. \quad (1)$$

This condition matches the eventual unforced common endpoint, but does not bound incumbent motion between admission and recovery. For one incumbent there are valid coherent sampled executions with $\zeta_+ = \zeta_{\mathcal{I}} = 0$ and an incumbent transient proportional to the newcomer's starting distance R .

Proof. For any fixed cohort with zero mean restoring error and zero mean forcing, differentiate $\xi + \dot{\xi}/C$ using $\ddot{\xi} + C\dot{\xi} = 0$. It is constant. Substitute the retained incumbent p, v and actual newcomer p_j, v_j into the new cohort mean to obtain (1).

For the transient, take one incumbent with $p_i = v_i = 0$, old correction zero, and a newcomer with $p_j = Ru$, $v_j = -CRu$ for a unit vector u . Use fixed zero anchors and the positive priority join rows $(1/2, 1/2)$; their goals are equal. Sample the full residual at the admission, commit it after $0 < L < h$, and hold it until the next commit. The old body remains at rest before the first commit. The committed correction is $m_i = -Ru/2$. For any $0 < \tau < h - L$, its exact held-input motion after the commit is

$$p_i(L + \tau) = \frac{KR}{2C} \left[\tau - \frac{1 - e^{-C\tau}}{C} \right] u.$$

The bracket is strictly positive because $1 - e^{-z} < z$ for $z > 0$. Yet (1) gives $\zeta_+ = 0$, and the parent's relative recovery gives the old body's eventual position zero. Thus endpoint compatibility alone does not give a distance-independent all-time bound. The finite waiting and coherent commit follow the same actual source-order assumptions as the parent. $\square$

3 Shielded live admission

Let $\mathcal{I}$ be the $n \geq 1$ incumbents and j the newcomer. At physical time t_a , apply the existing priority join map of [2] to obtain positive rows on the new objective support. A correct finite membership log and coherent bootstrap follow the applicable parent and [3] contracts. Set

$$p_k = x_k - r_k, \quad h_k = p_k - q_k, \quad \xi_{\mathcal{I}} = \frac{1}{n} \sum_{i \in \mathcal{I}} p_i, \quad \eta_i = p_i - \xi_{\mathcal{I}}, \quad e = p_j - \xi_{\mathcal{I}}, \quad g = q_j - \bar{q}_{\mathcal{I}}. \quad (2)$$

The fixed shared anchor matrix gives $q_k = w_k Z$. The objective count may differ from the physical incumbent count. Put $K = ab > 0$ and $C = a + b > 0$ as in [1]. All body positions and velocities are retained at t_a ; all incumbent r_i remain fixed. The infinite-horizon statements below concern this one admission with no further membership event. A later admission requires a fresh shield/release analysis and a cumulative seam budget.

At a complete same-time full-cohort origin snapshot, with actual source time $\sigma(t)$, define

$$m_k^+(t) = h_k(\sigma(t)) - \frac{1}{n+1} \sum_{\ell \in \mathcal{I} \cup \{j\}} h_\ell(\sigma(t)), \quad \bar{m}_{\mathcal{I}}^+(t) = \frac{1}{n} \sum_{i \in \mathcal{I}} m_i^+(t). \quad (3)$$

The full origin table, common committed epoch, $0 \leq t - \sigma(t) < H = h + L$, immutable origin/cohort metadata and locally finite commits are the counted service of [1]. During the capture phase use

$$\begin{aligned} \dot{x}_k &= v_k & (k \in \mathcal{I} \cup \{j\}), \\ \dot{v}_i &= -K(m_i^+ - \bar{m}_{\mathcal{I}}^+) - Cv_i + d_i, & i \in \mathcal{I}, \\ \dot{v}_j &= -K \frac{n+1}{n} m_j^+ - Cv_j + d_j. \end{aligned} \quad (4)$$

Before the first complete new-cohort commit, incumbents use their retained old coherent $\mathcal{I}$ -centered correction, whose incumbent sum is zero. The newcomer waits under a declared finite law. The first commit and this waiting prefix have bounds independent of $R = \|e(t_a)\|$. Old-support frames cannot enter new-support arithmetic. Neither a sample clock nor physical state is reset.

Lemma 1 (Exact physical-residual cancellation). *For every coherent full-cohort snapshot,*

$$m_i^+ - \bar{m}_{\mathcal{I}}^+ = h_i(\sigma) - \bar{h}_{\mathcal{I}}(\sigma), \quad \frac{n+1}{n} m_j^+ = h_j(\sigma) - \bar{h}_{\mathcal{I}}(\sigma). \quad (5)$$

Consequently, during shielding,

$$\ddot{\xi}_{\mathcal{I}} + C\dot{\xi}_{\mathcal{I}} = \bar{d}_{\mathcal{I}}, \quad (6)$$

$$\ddot{\eta}_i + C\dot{\eta}_i = -K\eta_i(\sigma) + K(q_i - \bar{q}_{\mathcal{I}})(\sigma) + d_i - \bar{d}_{\mathcal{I}}, \quad (7)$$

$$\ddot{e} + C\dot{e} = -Ke(\sigma) + Kg(\sigma) + d_j - \bar{d}_{\mathcal{I}}. \quad (8)$$

The mean identity also holds during the retained-correction waiting prefix.

Proof. Subtract the mean of the incumbent rows in (3) from each incumbent row. The full-cohort mean cancels. For the newcomer, direct subtraction gives $m_j^+ = n(h_j - \bar{h}_{\mathcal{I}})/(n+1)$. Substitute in (4), average over $\mathcal{I}$, and subtract that average from each body equation. The retained old correction sums to zero over $\mathcal{I}$, proving the waiting-prefix claim. No bound or limiting argument is used in this cancellation. $\square$

The newcomer enters the priority process at t_a and may change its actual endpoint. Its absolute physical residual affects only (8) during shielding. The incumbent mode (6) is exactly the old free translational mode; admission injects no R -dependent common acceleration. If every physical position is translated by the same constant Δ while velocities, offsets, fixed anchors, disturbances, clocks and the realized priority/service schedule are held fixed, each h_k gains Δ and every m_k^+ is unchanged. Thus (4) is translation-equivariant at this declared dynamical frame. An untranslated absolute environment may change a motion-dependent schedule; equivariance of such an environment is not inferred.

4 Capture and ordinary full-cohort release

Theorem 1 (History-aware capture). *Assume the actual new-support priority execution satisfies the final-support, positive-weight, bounded-use-age and joint-connectivity premises of [3, Sec. IV, Thm. 2] or [1, Sec. VII, P1]. Assume the parent coherent snapshot service and $KHG_v(0) < 1$. Take fixed bounded shared anchors, finite initial states and actual source/controller histories, uniformly bounded differential ordinary disturbances, and*

$$d_i - \bar{d}_{\mathcal{I}} \longrightarrow 0, \quad d_j - \bar{d}_{\mathcal{I}} \longrightarrow 0.$$

The service bound, incumbent initial history and disturbance bounds are independent of R . Then the shielded execution satisfies

$$\eta_i, \dot{\eta}_i \longrightarrow 0 \quad (i \in \mathcal{I}), \quad e, \dot{e} \longrightarrow 0.$$

The incumbent relative bounds supplied by the parent E1–E2 argument are independent of R . Thus the newcomer absorbs its arbitrary finite initial geometric error while incumbent pair geometry tends to $r_i - r_\ell$.

Proof. Actual priority convergence gives $w_k \rightarrow \mu_\sigma$ for every active row, even for permitted unequal directional or motion-dependent schedules. With one fixed bounded shared Z , both $q_i - \bar{q}_{\mathcal{I}}$ and g are uniformly bounded independently of R and tend to zero. After the actual coherent final-support history cut, (7) and (8) have precisely the delayed relative form treated by E1–E2 of [1], with their actual retained histories. Apply that proof separately to each incumbent relative coordinate and to e . Its finite small-gain bound for an incumbent uses only incumbent history, bounded objective geometry, differential forcing and the age/gain constants. The newcomer's finite history may depend on R , so its transient bound and capture time may depend on R , but E2 still proves convergence for every finite R . The finite waiting prefix does not couple R into incumbents under its stated contract. $\square$

Corollary 1 (Exact-shape capture option). *Suppose the incumbents enter the admission with $p_i(t_a) = \chi_0$ and $v_i(t_a) = v_0$ for every $i \in \mathcal{I}$, and experience one common ordinary disturbance $d_c(t)$ during capture. Instead of the incumbent line of (4), including its precommit retained-correction prefix, use the rigid capture line $\dot{v}_i = -Cv_i + d_c$,*

while retaining the same newcomer line after coherent commit and the same priority/snapshot service. Then $p_i(t) = \xi_{\mathcal{I}}(t)$ and $v_i(t) = \dot{\xi}_{\mathcal{I}}(t)$ for every incumbent throughout capture, so all actual pair offsets remain exactly $x_i - x_\ell = r_i - r_\ell$, independently of R , priority transients and unequal delays. The newcomer equation (8) and its capture conclusion are unchanged. The history-gated ordinary release below applies with $P_{\mathcal{I}} = 0$; after release, exact all-time rigidity additionally requires the parent's complete-history invariant-template conditions. Otherwise the ordinary relative controller may produce a bounded transient before restoring the offsets.

Proof. All incumbent equations have the same initial p, v and the same forcing, so uniqueness gives identical trajectories. Their mean obeys (6) with $\bar{d}_{\mathcal{I}} = d_c$. Subtract that equation from the retained newcomer line of (4); the result is (8). The release proof uses only the bounded actual incumbent history and the newcomer capture window, so it applies with zero incumbent relative history. The parent's invariant-template corollary supplies the stated additional sufficient condition after the ordinary switch. $\square$

Theorem 2 (Gated ordinary release and distance-free seam). *Under Theorem 1, fix $\varepsilon, \nu > 0$. A finite time T can be chosen after final-support bootstrap such that $\|e\|, \|\dot{e}\|$ are at most ε, ν , respectively, throughout $[T - H, T]$, and every table committed or pending at release has its actual source time in that full-cohort window. At T , switch without changing x, v to the ordinary parent full-cohort decoder/controller, with coherent correction and actual retained history. Later frames need not satisfy the capture thresholds; the parent's equations bound them. Its F1/E1–E2 conclusions apply from its later analysis cut, and its post-release relative-state bound can be chosen independently of R .*

Let ξ_+ be the full-cohort offset-corrected mean after release. Let $\xi_{\mathcal{I}}^{\text{ref}}$ be the analytical free mode continued from $(\xi_{\mathcal{I}}(T), \dot{\xi}_{\mathcal{I}}(T))$ under the actual future forcing $\bar{d}_{\mathcal{I}}$. For $t \geq T$,

$$\begin{aligned} \xi_+(t) - \xi_{\mathcal{I}}^{\text{ref}}(t) = \frac{1}{n+1} & \left[e(T) + \frac{1 - e^{-C(t-T)}}{C} \dot{e}(T) \right. \\ & \left. + \frac{1}{C} \int_T^t (1 - e^{-C(t-s)}) (d_j(s) - \bar{d}_{\mathcal{I}}(s)) ds \right]. \end{aligned} \quad (9)$$

If $d_j - \bar{d}_{\mathcal{I}} \in L^1([T, \infty))$, the seam is bounded for all $t \geq T$ by

$$B_{\text{seam}} = \frac{\varepsilon + \nu/C + \|d_j - \bar{d}_{\mathcal{I}}\|_{L^1(T, \infty)}/C}{n+1}. \quad (10)$$

With zero differential mean forcing, the limiting common translation differs from the free incumbent reference endpoint by at most $(\varepsilon + \nu/C)/(n+1)$. It is exactly equal if $e(T) + \dot{e}(T)/C = 0$; exact equality is not inferred from an arbitrary finite threshold release. For the actual incumbent centroid after release, $\xi_{\mathcal{I}} = \xi_+ - \eta_j^+/n$. Therefore its deviation from the free incumbent reference is at most $B_{\text{seam}} + P_+/n$ whenever P_+ bounds the post-release $\|\eta_j^+\|$, and its limiting deviation is at most B_{seam} when the parent relative recovery conclusion holds. The all-cohort centroid change at release is partly a change of cohort coordinates, not an instantaneous incumbent motion.

Proof. Theorem 1 makes the entire finite-age error window small after some finite time. Choose T after the complete final-support source and priority histories have become eligible; this prevents an old far-residual table from being used at the switch or as a pending pre-switch frame. At each pre-switch relevant source time,

$$\eta_i^+ = \eta_i - \frac{e}{n+1}, \quad \eta_j^+ = \frac{ne}{n+1}, \quad \dot{\eta}_i^+ = \dot{\eta}_i - \frac{\dot{e}}{n+1}, \quad \dot{\eta}_j^+ = \frac{n\dot{e}}{n+1}. \quad (11)$$

Thus the full-cohort history and its initial homogeneous-response terms are bounded by incumbent E1 bounds and the fixed thresholds, independent of R . Its priority-goal and disturbance-difference bounds are also independent of R . The parent E1–E2 proof applies to the unchanged full-cohort law after this actual history cut; F1 supplies the valid final-support bookkeeping. Coherent complete tables have zero full-cohort mean correction, so $\ddot{\xi}_+ + C\dot{\xi}_+ = (n\bar{d}_{\mathcal{I}} + d_j)/(n+1)$. At T , $\xi_+ - \xi_{\mathcal{I}}^{\text{ref}} = e(T)/(n+1)$ and the velocity difference is $\dot{e}(T)/(n+1)$. Solve this damped mean equation to get (9); the kernel factor lies in $[0, 1]$, proving (10). Position and velocity continuity follow from no reset and locally integrable accelerations; the acceleration may jump. $\square$

Corollary 2 (Optional exact endpoint with a newcomer-only velocity atom). *In addition to the history-gated release premises of Theorem 2, use the parent's separate measure-solution class. At T , finish the eligible coherent*

commit, measure the actual pre-atom $e(T) = p_j(T) - \xi_{\mathcal{I}}(T)$ and $\dot{e}(T-) = v_j(T-) - \bar{v}_{\mathcal{I}}(T-)$, and apply only to the newcomer the velocity jump

$$J_j = -Ce(T) - \dot{e}(T-), \quad J_i = 0 \quad (i \in \mathcal{I}). \quad (12)$$

and switch to the ordinary law using post-atom velocity. Define $\xi_{\mathcal{I}}^{\text{ref},M}$ as the free incumbent mode continued from $(\xi_{\mathcal{I}}(T), \dot{\xi}_{\mathcal{I}}(T-))$, driven by the actual future ordinary forcing $\bar{d}_{\mathcal{I}}$ and every future incumbent-mean velocity atom $\bar{J}_{\mathcal{I},\ell}$ on the open interval $(T, t]$. Assume $d_j = \bar{d}_{\mathcal{I}}$ after T and that at each future atom $J_{j,\ell} = \bar{J}_{\mathcal{I},\ell}$; any remaining differential impulse variation obeys the parent's recovery premise. Then the full-cohort mean and this measure-class reference have the exact difference

$$\xi_+(t) - \xi_{\mathcal{I}}^{\text{ref},M}(t) = \frac{e(T)}{n+1} e^{-C(t-T)}, \quad t \geq T. \quad (13)$$

If the reference has a finite endpoint and the parent's shared-anchor relative recovery hypotheses hold, every incumbent ends at exactly $r_i + \xi_{\mathcal{I}}^{\text{ref},M}(\infty)$. The jump obeys $\|J_j\| \leq C\varepsilon + \nu$, independently of the original newcomer distance. At the compensating release event, every incumbent position and velocity remains continuous; newcomer position is continuous but its velocity is intentionally discontinuous. Later external atoms, if any, can of course jump incumbent velocities. This is an optional nominal measure-class result, not a finite-acceleration realization or part of the ordinary continuous-velocity release theorem.

Proof. The compensating atom changes only the newcomer's velocity, so the post-atom relative velocity is $\dot{e}(T+) = -Ce(T)$. Put $y = \xi_+ - \xi_{\mathcal{I}}^{\text{ref},M}$. At the cut,

$$y(T) = \frac{e(T)}{n+1}, \quad \dot{y}(T+) = -\frac{Ce(T)}{n+1}.$$

At a future atom, the full-cohort mean jump minus the reference jump is

$$\Delta \dot{y}_{\ell} = \frac{J_{j,\ell} - \bar{J}_{\mathcal{I},\ell}}{n+1} = 0.$$

The ordinary difference also vanishes. Thus the difference has unforced damped evolution between atoms and no jumps; its solution is (13). The parent measure convention counts the compensating atom in the post-atom initial velocity and uses only future atoms on $(T, t]$; it is not counted twice. The right-initial relative velocities differ from their pre-atom values by at most $\|J_j\|$, so the parent's impulse/retained-history bounds remain independent of the original R under the capture thresholds. Shared-anchor relative recovery makes $\eta_i^+(t) \rightarrow 0$, and hence gives the stated incumbent endpoints. The triangle inequality gives the jump bound. $\square$

Corollary 3 (Incumbent displacement independent of newcomer distance). *This corollary concerns the ordinary no-velocity-atom branch of Theorems 1–2, not the optional measure-class Corollary 2. In addition assume $\bar{d}_{\mathcal{I}} \in L^1([t_a, \infty))$ and $d_j - \bar{d}_{\mathcal{I}} \in L^1([T, \infty))$, both with bounds independent of R . Let*

$$B_0 = \frac{\|\dot{\xi}_{\mathcal{I}}(t_a)\|}{C} + \frac{\|\bar{d}_{\mathcal{I}}\|_{L^1(t_a, \infty)}}{C}.$$

Let $P_{\mathcal{I}}$ bound each incumbent $\|\eta_i\|$ over shielding, including the finite waiting prefix, and let P_+ be the parent's post-release E1 full-cohort position bound from (11). The stated premises make both independent of R . Then

$$\sup_{t \geq t_a} \|x_i(t) - x_i(t_a)\| \leq B_0 + \|\eta_i(t_a)\| + \max\{P_{\mathcal{I}}, P_+ + B_{\text{seam}}\}, \quad i \in \mathcal{I}. \quad (14)$$

If the ordinary differential inputs vanish as in the parent theorem, incumbent offsets again converge to $r_i - r_{\ell}$ after release.

Proof. Before release, $x_i = r_i + \xi_{\mathcal{I}} + \eta_i$ and (6) bounds the mean excursion by B_0 . After release, $x_i = r_i + \xi_+ + \eta_i^+$; compare ξ_+ with the continued free mode using (10), and apply the parent's E1 bound P_+ . The initial r_i cancels. These are uniform bounds on the actual path; no future priority endpoint is fixed in advance. $\square$

For a measure-class displacement extension, the actual future incumbent-mean impulse variation must also enter B_0 , and differential impulse variation must enter the parent's relative bound. A common external atom of arbitrary size is not bounded by the ordinary L^1 disturbance assumptions.

5 Sharp scope and adversarial tests

Exact incumbent offsets. The r_i are unchanged and incumbent pair positions and velocities are continuous at admission. Exact preservation of pair differences for every positive time needs additional hypotheses. For example, if the complete incumbent source/controller history has $\eta_i = \dot{\eta}_i = 0$, every consumed and future $q_i - \bar{q}_T = 0$, and $d_i = \bar{d}_T$, uniqueness of (7) preserves the offsets exactly during shielding. Mere agreement of current priority rows is insufficient when a stale unequal source remains eligible. Unequal incumbent relative velocities at t_a make exact positive-time pair-offset preservation impossible under velocity continuity. The general result promises no jump, a distance-free bound and eventual restoration.

Delayed history and priority endpoints. The fixed-delay invariant of [3, Thm. 1] weights complete initialized history layers, and its causal endpoint depends on the realized future. Unequal directional delays can therefore change μ_σ after admission. The shield protects a physical common mode; it does not preserve the old priority endpoint. With fixed shared anchors, a new common goal cancels from eventual pair geometry. The parent's local-profile extension can instead give a different bounded terminal shape; then the newcomer tracking input tends to $\mu_\sigma(Z_j - \bar{Z}_T)$, and a small-zero-error release needs corresponding profile centering.

Old far snapshots. For one incumbent, a still-eligible full snapshot generated with $h_i = 0$, $h_j = Ru$ has $m_i = -Ru/2$. Releasing while that frame remains eligible gives immediate incumbent acceleration $KRu/2$, even if the newcomer's *current* position is close. The complete source/pending window in Theorem 2 is necessary for the stated uniform bound.

Repeated admissions. For finite successive releases the seam contributions accumulate under their actual cohort sizes. With $e_k = \varepsilon u$, $\dot{e}_k = 0$, zero differential forcing and enough quiet time between events, the common-mode shifts $\varepsilon u/(n_0 + k)$; the harmonic sum is unbounded over infinitely many admissions. An infinite-event uniform bound needs a summable seam budget and uniform service/relative premises. The parent finite-membership theorem is not a perpetual-churn result.

Unbounded initial separation. A finite speed cap $V_{\max}$ makes capture from distance R require at least $(R - O(1))/V_{\max}$ time. The nominal linear newcomer command may itself scale with R . A distance-free *incumbent displacement* bound is compatible with distance-dependent capture time and newcomer energy. Position-valued anchors or offsets derived from the newcomer's distant start can also make the goal bound scale with R and invalidate Corollary 3.

Finite waiting does not force an exact zero seam. Take any allowed fixed sampling clock with $KHG_v(0) < 1$, constant common priority goals, one incumbent, and zero incumbent disturbance. Choose $0 < \lambda < C$ and the actual newcomer history $e(s) = e^{-\lambda s}u$ on $[-H, 0]$ for a unit vector u . During shielding prescribe the locally integrable disturbance

$$d_j(t) = (\lambda^2 - C\lambda)e^{-\lambda t}u + Ke^{-\lambda\sigma(t)}u.$$

Equation (8) then has the exact solution $e(t) = e^{-\lambda t}u$ for $t \geq 0$. The disturbance is bounded and integrable because $0 \leq t - \sigma(t) < H$, and $e, \dot{e} \rightarrow 0$. Nevertheless $e(t) + \dot{e}(t)/C = (1 - \lambda/C)e^{-\lambda t}u$ never vanishes at finite time. If the differential forcing is set to zero after release, the endpoint seam is nonzero for every finite release selected only by waiting. Exact finite matching needs an additional steering condition or a fortunate state.

6 Implementation and claim boundary

The algebra assumes a complete coherent origin table, known incumbent identities, a zero-sum retained incumbent correction, correct support filtering, actual source-age gating and the original priority-service contracts. A practical admission state machine and safe physical approach are separate design and validation questions. Nothing here certifies the supplied simulator, finite-precision arithmetic, actuator bounds, radio availability, collision avoidance or a rigid-body vehicle. The parent version 05 and the separate sampled common-translation latch addendum remain unchanged. Literature priority, independent human review and public release are open. The release time in Theorem 2 is an *existential eligibility condition*. The parent origin frames contain residuals $h = x - r - q$ and

metadata; by themselves they do not provide a coherent current physical centroid, velocity or complete current-error certificate. An online detector for the $e, \dot{e}$ and source-window tests, and for the optional impulse (12), needs an explicitly supplied observation and communication contract. No implemented detector is claimed.

AI-use disclosure

This work was developed with assistance from AI agents operating within the HORTRAME Systems research architecture. Depending on the research stage, these agents contributed to literature analysis, mathematical formulation, proof reconstruction, adversarial review, counterexample search, simulation and code analysis, verification design, reproducibility checks, revision, and manuscript preparation. AI-agent outputs were treated as research artifacts subject to verification and correction rather than as independent authority. G. Bolduc is the human author responsible for the manuscript, its claims, source selection, and publication decisions. AI-agent review does not constitute independent human peer review, proof-assistant certification, experimental validation, or publication acceptance.

Human final acceptance of this internal addendum is pending.

COVARIANT developed the shielded admission and release bounds. ORDINAL independently derived the unshielded distance and transient counterexamples, the common-phase compatibility test, and the optional newcomer-only impulse; it then reviewed the exact pre-impulse manuscript. Their shared parent sources and exchanged candidate limit independence. The repaired measure reference, the impulse result and this front matter require affected review at this exact source revision.

References

- [1] G. Bolduc, *Translation-Equivariant Disturbance Recovery in Delayed Open Priority Networks*, working preprint, ver. 05, 2026. Exact LaTeX SHA-256: 165c9b5dda01ae9573a2af28f0b9bd78ec380bce653e594cc4a3ba4662260773.
- [2] G. Bolduc, *Priority-State Dynamics in Open Multi-Agent Systems: Dynamic Membership and History-Dependent Consensus Endpoints*, full ed., ver. 07, 2026. Exact PDF SHA-256: c3171ce35ca77b61cdacf5beb8f8288f7335472682ad0a6cdab071d553622bc8.
- [3] G. Bolduc, *Exact Restoration and Historical Memory in Delayed Priority Networks with Three-Dimensional Motion*, selected ver. 0.6, 2026. Exact PDF SHA-256: 8cd68abb9262d4dbc0727ac9bae67364dcaa27bb77972a09c787e0fff71973f0.