

Paper 017

Conservation-First Stress-Energy Audits for Closed Electromagnetic Devices

A reusable accounting framework for cavities, capacitors, coils, and claimed inertia anomalies

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Abstract

Closed-device propulsion and inertia claims fail when momentum and energy channels are not fully accounted. This paper generalizes the cavity/HFGW closure paper into a conservation-first audit framework applicable to capacitors, microwave cavities, superconducting coils, pulsed plasma-adjacent devices, and field-energy conversion claims. Every measurement is interpreted through a stress-energy ledger before any anomalous channel is considered.

Status. Draft manuscript for review and revision. This paper is not an empirical claim of new physics or field-ready technology. It is a structured proposal, theory note, protocol, or application architecture intended to be auditable, falsifiable, and publishable with source.

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1 Problem

A balance displacement can arise from thermal expansion, RF leakage, cable forces, acoustic coupling, magnetic interaction, outgassing, support creep, photon emission, or data analysis bias. The problem is to prevent a residual label from being attached until the ledger of ordinary momentum and energy channels is closed with declared uncertainty.

2 Model

We define an audit volume, boundary fluxes, field energy, matter momentum, thermal reservoirs, emitted radiation, and support reactions. The residual is a bounded remainder after calibration against known references. Acceptance requires the residual to transform differently from every included ordinary channel.

$$\frac{d}{dt}(P_{\text{matter}} + P_{\text{field}}) = - \int_{\partial V} T^{ij} n_j dA + F_{\text{support}} + F_{\text{external}}.$$

$$R_{\text{anom}} = F_{\text{meas}} - \sum_k F_k^{\text{ordinary}}, \quad |R_{\text{anom}}| < z_{0.95} \sqrt{\sigma_{\text{meas}}^2 + \sum_k \sigma_k^2}.$$

3 Claims

1. **Claim 1.** No closed electromagnetic device should be interpreted as propulsion before a signed stress-energy ledger exists.
2. **Claim 2.** Photon-thrust calibration is a minimum acceptance test for micro- and nano-newton balances used in cavity studies.
3. **Claim 3.** Conservation audits should be reusable across speculative mechanisms because ordinary channels recur across devices.
4. **Claim 4.** A null closure paper can be publishable even when no new force is present.

4 Evidence Plan

Evidence consists of a template audit applied to three device classes: microwave cavity, asymmetric capacitor, and superconducting coil. Each case includes a known injected force or heat source, a closure budget, and an independent reviewer checklist. The paper aims to demonstrate that claimed residuals shrink or become bounded when the ledger is complete.

5 JMP0X1B Implementation Surface

JMP0X1B can encode an auditable ledger with units, calibration provenance, and effect labels for measurement, simulation, and human sign-off. The code path should block publication of a residual claim until required ledger rows are present.

Illustrative JMP0X1B-style contract

```
record Channel { name: Text, model: ModelRef, estimate: Quantity, uncertainty: Quantity, evidence: Quantity }
record StressEnergyLedger { audit_volume: Geometry, channels: List<Channel>, residual: Quantity }
fn certify_closure(ledger: StressEnergyLedger) -> Gate effects{Units, Provenance, Audit}
```

6 Release And Review Plan

Release ledger schemas, worked examples, calibration templates, and checklists for reviewers. Each future device paper should cite a ledger version rather than reinventing accounting language.

7 Open Questions

- What ordinary channels are often missed in pulsed high-voltage devices?
- How can confidential apparatus geometry be redacted without making the ledger useless?
- What threshold should promote a result from residual to anomaly candidate?
- Can balance calibration be standardized across independent labs?

8 Conclusion

Conservation-first audits are intentionally hostile to extraordinary interpretations. That hostility is productive: it makes any surviving result more credible and every null more reusable.

References

References

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