

BenchEWS Research Programme

ECHO - Mathematical Sonar for Complex Systems

THE GUIDING QUESTION

Under which conditions do complex systems lose their capacity for self-correction?

Programme at a glance

PROGRAMME Independent, comparative and reproducible study of early-warning signals, resilience and self-correction in complex adaptive systems.	METHOD Indicators are measurement instruments subject to testing. Claims require assumptions, validity domains, uncertainty and a path to failure.
ECHO Specified diagnostic architecture for data, observation quality, feedback, response and validation. Mathematical sonar is a metaphor.	ABSTENTION When data or identifiability are insufficient, withholding a diagnosis is a regular scientific result.

Mallinckrodt cycle

A conceptual and falsifiable model describing a viability corridor between under-order and over-order. It is not an empirically established universal law and does not predict specific collapse events.

Software and status

STUDIO 1.4.0	Published software and documentation. Official hardware-validated platform status: macOS on Apple Silicon.
STUDIO 2.0 ECHO	Specified and under development; not a universally validated measuring instrument.
AIP MANUSCRIPT	Revised and resubmitted to AIP Advances; under editorial review. Not described as accepted or published.

Authorship and AI assistance

Bernd von Mallinckrodt solely initiated, conceived and built BenchEWS and retains full scientific responsibility. AI systems support research, programming, documentation and quality assurance; they are not authors.

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