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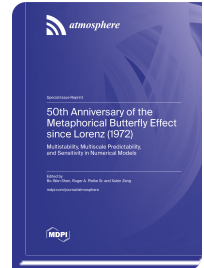
50th Anniversary of the Metaphorical Butterfly Effect since Lorenz (1972): Multistability, Multiscale Predictability, and Sensitivity in Numerical Models

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This year marks the 50th anniversary of the metaphorical butterfly effect, born from Edward Lorenz's 1963 work on initial condition sensitivity. In 1972, it became a metaphor for illustrating how minor changes could yield an organized system. •Lorenz Models: Chaos and Regime Changes: Explore Lorenz models' 1960–2008 evolution, chaos theory, and coexisting attractors. •Unraveling High-dimensional Instability: Challenge norms in "Butterfly Effect without Chaos?" as non-chaotic elements contribute uniquely. •Modeling Atmospheric Dynamics: Delve into atmospheric dynamics via "Storm Sensitivity Study." •Navigating Data Assimilation: Explore data assimilation's dance in chaotic and nonchaotic settings via the observability Gramian. •Chaos, Instability, Sensitivities: Explore chaos, instability, and sensitivities with Lorenz's 1963 and 1969 models. •Unraveling Tropical Mysteries: Investigate tropical atmospheric instability, uncovering oscillation origins and cloud–radiation interactions. •Chaos and Order: Enter atmospheric regimes, exploring attractor coexistence and predictability. •The Art of Prediction: Peer into predictability realms, tracing the "butterfly effect's" impact on predictions. •Navigating Typhoons: Journey through typhoons, exploring rainfall and typhoon trajectory prediction. •Analyzing Sea Surface Temperature: Examine sea surface temperature analysis and nonlinear analysis for classification.



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