

11 – Empirical Tests of Global Geometric Constraint

Note

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The Time-Symmetric Parity Constraint (TSPC) is defined by a single global condition imposed on the geometry of spacetime. Its empirical assessment must therefore differ in kind from that usually applied to cosmological models constructed through layered dynamical ingredients. The question is not whether the framework can be made to fit a wide range of observations, but whether there exist observations that probe the validity of the imposed constraint directly, rather than accommodating its consequences through auxiliary assumptions.

Modern cosmology offers an abundance of observational data, but not all data constrain structure. Many observables admit successful description only because the underlying framework permits substantial flexibility: additional degrees of freedom, phenomenological parameters, or simulation-dependent calibration. Such flexibility is often presented as pragmatic. Within TSPC it is treated as diagnostically weak. An empirical test is of value here only insofar as it interrogates global geometry itself, rather than local microphysics or model-dependent reconstruction.

Accordingly, the empirical tests selected in this section satisfy a restrictive criterion. Each probes either large-scale spatial geometry, the propagation of physical signals through spacetime, or the coherence of temporal structure across cosmological scales.

In each case, the observable in question depends directly on the global geometric organisation of spacetime and would not be expected to survive unchanged were the parity constraint absent. Tests that primarily reward parameter freedom, baryonic modelling, or simulation tuning are deliberately excluded.

The papers that follow are therefore not intended as an exhaustive survey of cosmological anomalies. They are selected pressure points. Their ordering reflects logical dependence rather than historical sequence, proceeding from spatial geometry, through spacetime propagation, to explicitly temporal behaviour. Together they constitute a minimal but sufficient empirical interrogation of the constraint.

Several other potential tests merit brief comment but are not relied upon here. Direct measurements of redshift drift offer a conceptually decisive probe of cosmic time evolution, but remain empirically immature. Claims of cosmic birefringence raise questions of parity but are presently entangled with instrumental systematics and model-dependent interpretation. Galaxy age distributions near the present epoch are suggestive but depend heavily on stellar population modelling and are therefore not clean probes of global structure. These avenues are acknowledged, but excluded, on grounds of present evidential ambiguity.

What follows is thus intentionally selective. The aim is not to demonstrate empirical abundance, but to establish whether a framework defined by a single geometric constraint encounters decisive resistance

when confronted with observations that genuinely test geometry. Only such resistance would count against it; only such tests are admitted here.

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