

## Local Cosmography from Causal Set Pixies

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In causal set theory, spacetime is represented by a locally finite partially ordered set. The abundances of small combinatorial structures can be used to recover information about its continuum geometry. We study how chains and 2-pixies can be used to recover local cosmological quantities in four-dimensional, spatially flat FLRW spacetimes. For causal diamonds centered on a comoving observer, we calculate the symmetric abundances through fourth order in the proper duration and the difference between upward and downward 2-pixies through third order. Riemann normal expansions identify the geometric terms, and exact integration in conformal coordinates gives their coefficients. The symmetric counts determine combinations of the Hubble and deceleration parameters. The difference between upward and downward 2-pixies probes curvature evolution and gives access to the dimensionless third derivative of the scale factor, known as the cosmological jerk. We test the calculation with independent continuum integration and simulated causal sets, and study the inference using the full covariance of the counts. The tests separate geometric truncation error from sampling uncertainty and show the cost of including higher-order terms. The construction uses calibrated interval durations. Applying it within one causal set requires an intrinsic clock and a treatment of correlations between overlapping intervals.

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