

## Exact tests for singular network data

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**Abstract** We propose methodology for exact statistical tests of hypotheses for models of network dynamics. The methodology formulates Markovian exponential families, then uses sequential importance sampling to compute expectations within basins of attraction and within level sets of a sufficient statistic for an over-dispersion model. Comparisons of hypotheses can be done conditional on basins of attraction. Examples are presented.

**Keywords** Basin of attraction · Biological network · Conditional test · Polynomial dynamics · Sequential importance sampling · Sufficient statistic