

## The algebra of reversible Markov chains

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**Abstract** For a Markov chain, both the detailed balance condition and the cycle Kolmogorov condition are algebraic binomials. This remark suggests to study reversible Markov chains with the tool of Algebraic Statistics, such as toric statistical models. One of the results of this study is an algebraic parameterization of reversible Markov transitions and their invariant probability.

**Keywords** Reversible Markov chain · Algebraic statistics · Toric ideal