

# Derivation of mean-field rate equations for misanthrope processes

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We study the single-site dynamics in interacting particle systems (IPS) of misanthrope type with bounded rates on a complete graph. In the limit of diverging system size we establish convergence to a Markovian non-linear birth-death chain, described by a mean-field rate equation known from exchange-driven growth processes. Conservation of mass in the IPS leads to conservation of the first moment for the limit chain, and to interesting ergodic behaviour for models that exhibit condensation. The proof is based on a coupling to branching processes via the graphical construction, and establishing uniqueness of the solution for the limit dynamics.