UNIVERSITÀ DEGLI STUDI DI BARI ALDO MORO

Bari Theory Xmas Workshop 2016

Phase transitions and metastability in the Zeta-urn model

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Zeta-urn model

Stochastic model defined on a finite connected graph of M sites

$\sum_i n_i(t) = N$ $\quad\quad$ $r_i(t)$ occupation number

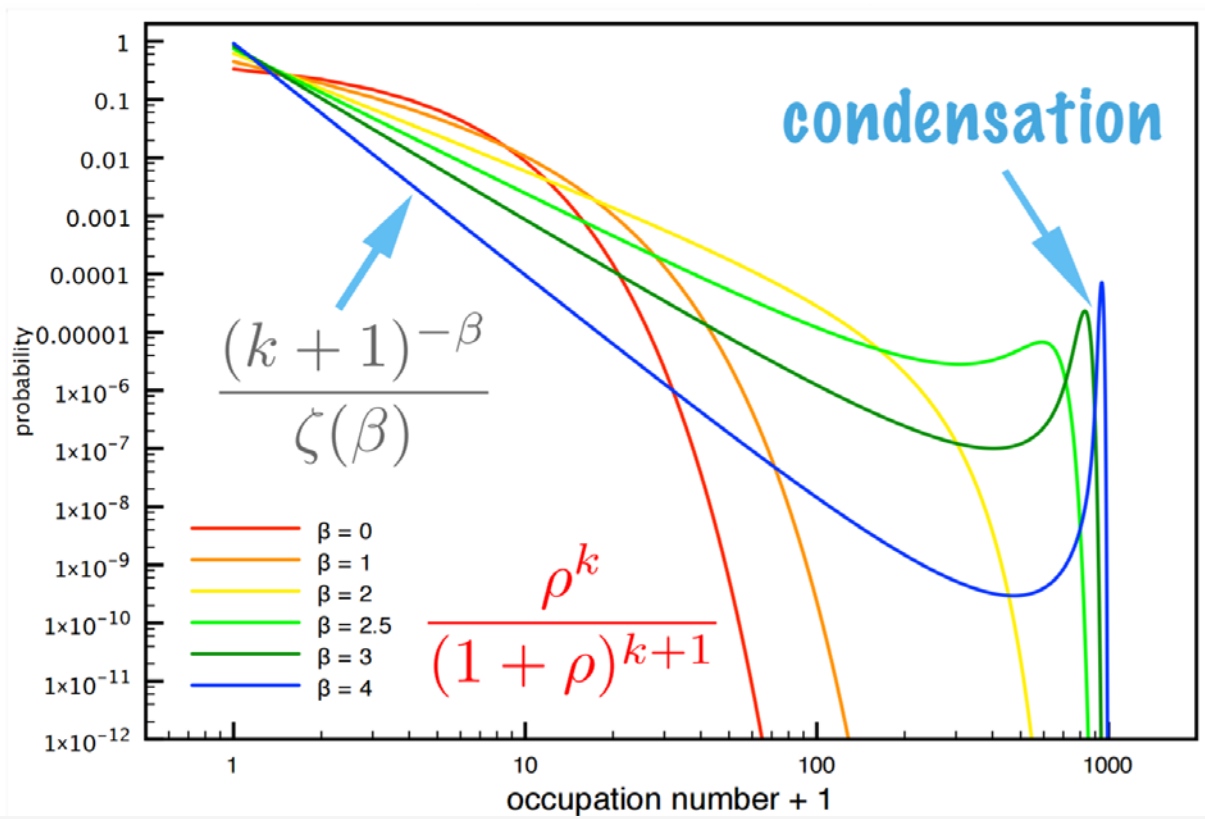
- Energy of a configuration $E(\{n_i\}) = \sum_i \ln(n_i + 1)$
- Partition function $\mathrm{Z(N, M)} = \prod_i \sum_{r_i} p(n_i)\, \delta(\sum_i n_i - N)$

$$p(r_i) = \exp\big(-\beta E(n_i)\big)\ \textit{Boltzmann weights}$$

In the low temperature phase ($\beta > 2$) a condensate appears

Condensation

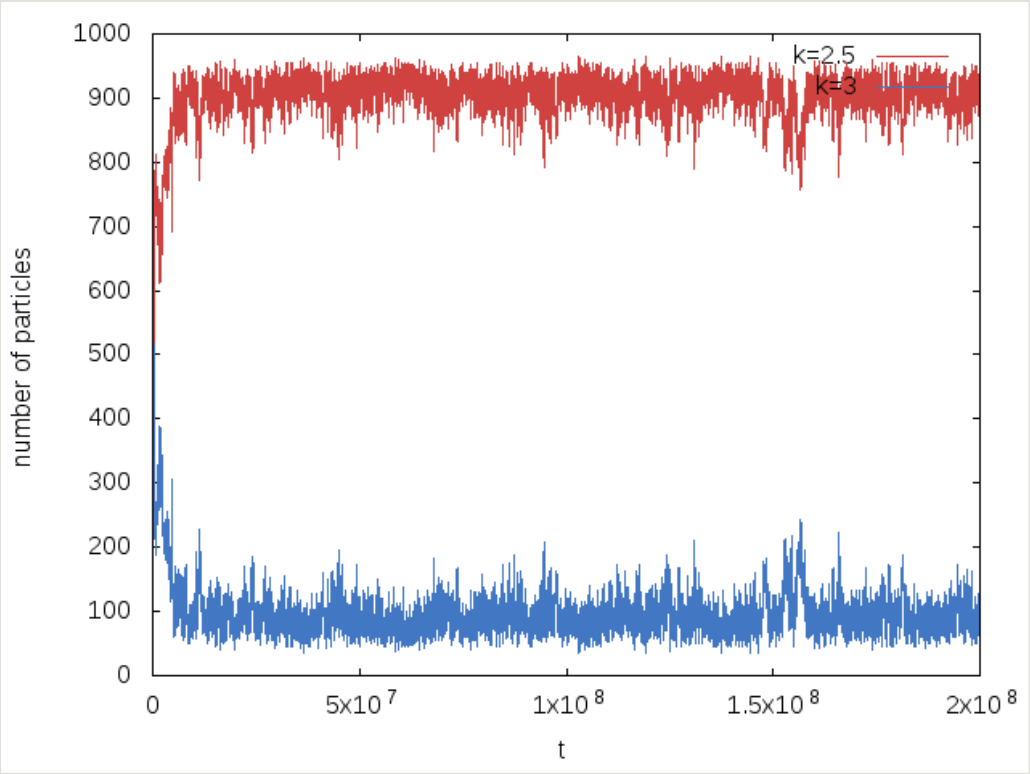
Probability distribution for the occupation number



Condensation and equilibration in an urn model, F Corberi, G Gonnella, A Mossa
Chaos, Solitons & Fractals 81, 510-518 (2015)

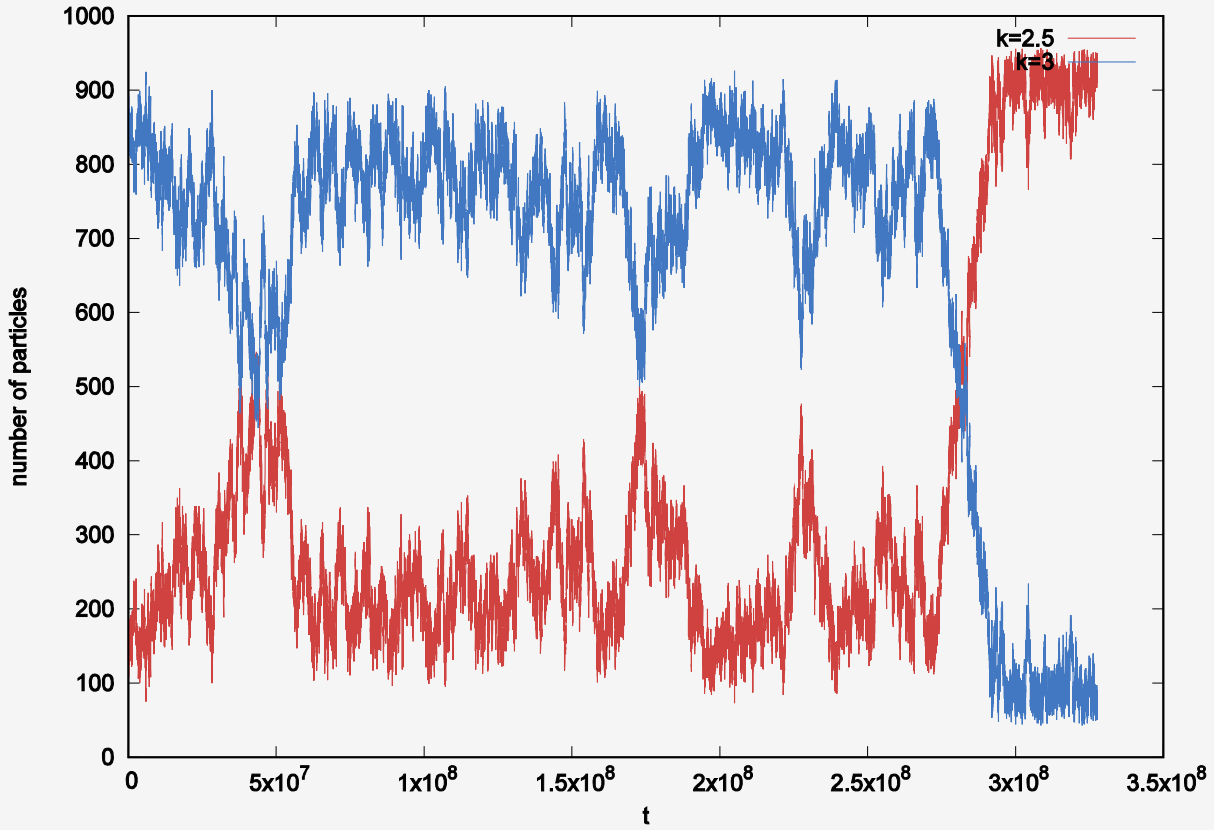
Inhomogeneous Zeta-urn model

System first thermalized than quenched at two different temperatures for two equally divided parts



Inhomogeneous Zeta-urn model

Start with a condensed configuration in one side



Metastability