

Super Solutions of the Model RB

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Problems & Ideas

- Problems:
 - Super solutions of many constraint satisfaction problems can be viewed as a certain type of "locally maximum" subset of the standard solutions. The study of super solutions of model RB can reflect the structure of solution space and stability of solutions.
- Ideas:
 - An Asymptotic first-moment argument is performed to count the expected number of (1,1)-super solutions of the model RB.
 - Inclusion/exclusion rules help to get a relatively precise estimation of the expected number of (1,1)-super solutions.

Main Contributions

- Contributions:

Theorem 1. Let Y be the number of (1, 1)-super solutions of the model RB. Then

$$\lim_{n \rightarrow \infty} \mathbf{E}[Y] = \begin{cases} 0, & \text{if } r > -\frac{\alpha}{\ln p}, \\ +\infty, & \text{if } r < -\frac{\alpha}{\ln p}. \end{cases}$$

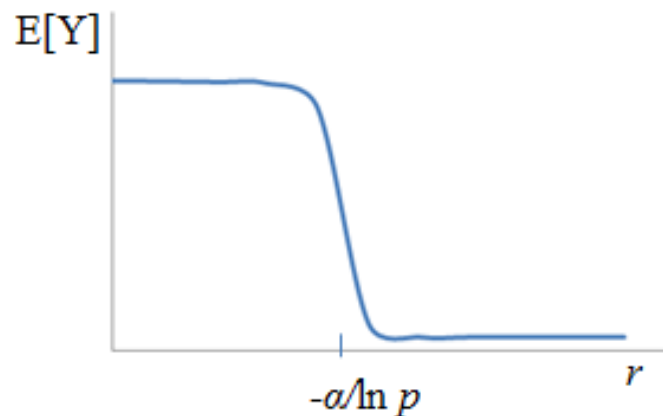


Fig1: The expected number of (1,1)-super solutions of model RB undergo phase transitions from infinity to 0.