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Developments in perfect simulation of Gibbs measures through a new result for the extinction of Galton-Watson-like processes

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This paper deals with the problem of perfect sampling from a Gibbs measure with infinite range interactions. We present some sufficient conditions for the extinction of processes which are like supermartingales when large values are taken. This result has deep consequences on perfect simulation, showing that local modifications on the interactions of a model do not affect simulability. We also pose the question to optimize over a class of sequences of sets that influence the sufficient condition for the perfect simulation of the Gibbs measure. We completely solve this question both for the long range Ising models and for the spin models with finite range interactions.

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