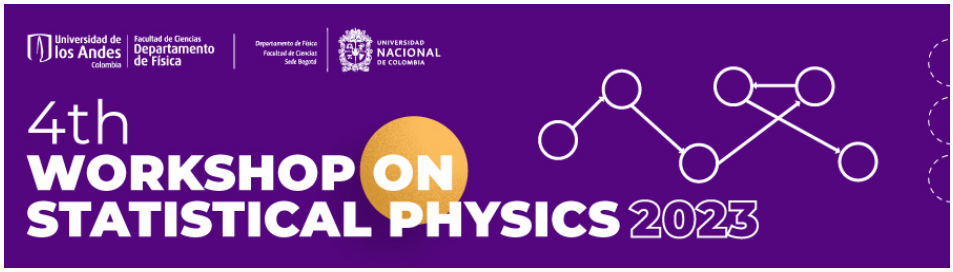

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Competition between convergence and conviction in a kinetic model of opinion formation with limited influence

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The kinetic model of opinion formation by Deffuant-Neau-Amblard-Weisbush (DNAW), one of the most well-known in sociophysics, describes the process of opinion formation towards consensus or homogeneous opinions. This is done by considering exchanges of opinion between pairs of agents, in such a way that these exchanges have limited influence as they are confined within a range of opinion and depend on a parameter called "convergence," which takes values between 0 and 0.5. In this work, we propose a kinetic model of opinion formation, which generalizes the DNAW model by including a parameter of "conviction" that allows describing the opinion formation process in terms of the competition between convergence and conviction. We show that the number of time steps required to reach opinion consensus depends not only on the parameters of range and conviction but also on the convergence parameter. In this model, the convergence parameter now takes values between 0 and 1. Additionally, we demonstrate the existence of opinion phase transitions, observed through the variation of the average opinion. Finally, we show that this model can generate patterns of heterogeneous opinion distribution, in addition to the homogeneous patterns that are characteristic of the DNAW model.

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