

V. CONCLUSIONS.

Summing up, we have numerically studied an Axelrod model in which two different mechanisms are at work. The first takes into account that agents are prone to change their state according to a sort of social influence given by a (variable) neighborhood made up of their nearest (both in space and in cultural similarity) neighbors. The dynamics of the agents is also ruled by a Mass Media effect, represented in this case by an agent that keeps fixed its cultural traits all the time. The dynamics of the system is such that at low and high values of initial social diversity q , a monocultural state is attained, with a stronger dependency on the mass media strength (ϵ) at large q values. The reason behind the formation of these monocultural states is the varying size of the set of neighbors with social influence: the higher the diversity of initial cultural traits, the less is the number of agents in the neighborhood of an agent. Admittedly, the more interesting behavior is for intermediate values of q , where the system dynamics attains a minimum in the size of the biggest monocultural cluster. At those values of q the initial diversity is such that the mass media has to compete with a larger number of neighbors of the agent and thus its information is not necessary on the majority. Then, in this case the mass media fails to drive the system to an homogeneous cultural state. Nevertheless, the increase of the mass media strength for a fixed network size always reinforces the monocultural state.

On the contrary, the increase of the network size was proven to be a parameter which strongly drives the system to a polarized society where all the possible cultural configurations are present. The amount of final number of cultures also follows a power-law dependence when the social influence is at work, but the exponent value found here is lower than that reported for the case of the original Axelrod model with dyadic interaction. When mass media is present it only succeeds in preventing the full multicultural state for increasing size of the society and the amount of cultures obtained saturates. Moreover, the saturation value was found to be independent of the mass media strength in our calculations.

We have also studied the model with noise representing errors in copying traits and in the formation of the social influence interactions. In radical difference with previous works where the noise is present on the whole society, we have included here noise effects only in those agents which are active according to the rules of the social interaction. This allowed us to reach well-defined final absorbing states and correspondingly a higher precision in the