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Interacting particle systems provide flexible and powerful models that are useful in many application areas. The motivation that we will address comes from the opinion dynamics. In particular, we are interested in particle systems with large number of particles, hence they are very complex from the computational point of view. A common strategy is to derive effective equations that describe the time evolution of the empirical particle density. The equation that is obtained has the form of the Dean-Kawasaki equation which is well-known for its singular structure that results in difficulty of its rigorous mathematical interpretation. Our aim is to consider non-linear SPDE models that provide approximation of the Dean-Kawasaki equation. We will discuss the well-posedness of these equations and the preservation of physical constraints of the particle system. Finally, we will also approach the question of its approximation and in particular of preservation of positivity at the discrete level.

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