Coalescing-fragmentating Wasserstein dynamics

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The discussion will be devoted to a family of interacting particles on the real line which has a connection with the geometry of Wasserstein space of probability measures. We will consider a physical improvement of the classical Arratia flow, but now particles can split up and they transfer a mass that influences their motion. The particle system can be interpreted as an infinite dimensional version of sticky reflecting dynamics on a simplicial complex. The model is also a particular solution of the ill-posses Dean-Kawasaki equation, SPDE which arises in macroscopic fluctuation theory and glassy materials. In the talk, I am going to discuss the existence and properties of such a particle system. In particular, I will briefly consider a reversible case, where the construction is based on a new family of measures on the set of real non-decreasing functions as reference measures for naturally associated Dirichlet forms. In this case, the intrinsic metric leads to a Varadhan formula for the short time asymptotics with the Wasserstein metric for the associated measure-valued diffusion.