On the spatially inhomogeneous particle coagulation-condensation model with singularity

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Abstract

The spatially inhomogeneous coagulation-condensation process is an interesting topic of study as the phenomenon's mathematical aspects mostly undiscovered and has multitudinous empirical applications. In this present exposition, we exhibit the existence of a continuous solution for the corresponding model with the following \emph{singular} type coagulation kernel: \[K(x,y)˜\le˜\frac{\left(x + y\right)ˆ\theta}{\left(xy\right)ˆ\mu}, ˜˜\text{for} ˜x, y \in (0,\infty), \text{where}˜ \mu \in \left[0,\tfrac{1}{2}\right] \text{ and } ˜\theta \in [0, 1].\] The above-mentioned form of the coagulation kernel includes several practical-oriented kernels. Finally, uniqueness of the solution is also investigated.

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