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Theoretical base and numerical tools for modeling transitions between continuous and disperse multiphase motions[1] DUAN ZHANG, XIA MA, PAUL GIGUERE, Los Alamos National Laboratory — Transitions between continuous and disperse multiphase motions happen commonly in nature and in our daily life. The phenomena include dissolving sugar cubes in a cup, formation of rain and hail, shattering a piece of glass. The capability of numerically simulating these phenomena is both important to industrial applications and to the understanding of nature. Relative to other aspects in this topic, theories for disperse multiphase flow is better developed despite many important issues still to be resolved. The theory for continuous multiphase flow is still in its infancy. The study of transition between continuous and disperse multiphase motion is at an even earlier stage of development. In this talk, we describe a possible theoretical framework based on the probability and statistical theory and a useful numerical method in simulating these phenomena. Deficiencies in the theory and in the numerical method are also discussed.

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