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An extended quadrature method of moments for polydisperse multiphase flows[1] CANSHENG YUAN, RODNEY FOX, DEPARTMENT OF CHEMICAL AND BIOLOGICAL ENGINEERING, IOWA STATE UNIVERSITY, AMES, IA, USA TEAM — Polydisperse multiphase flows arise in many applications, and thus there has been considerable interest in the development of numerical methods to find solutions to the kinetic equation used to model such flows. Quadrature-based moment methods (QBMM) are an important class of methods for which the accuracy of solution can be improved in a controlled manner by increasing the number of nodes. However, when large numbers of nodes are required to achieve the desired accuracy, the moment-inversion problem can become ill-conditioned. In this work, a new generation of quadrature algorithms is introduced that uses an explicit form for the distribution function. This extended quadrature method of moments (EQMOM) approximates the distribution function by a sum of classical weight functions, which allow unclosed source terms to be computed with great accuracy by increasing the number of quadrature nodes independent of the number of transported moments. Here we use EQMOM to solve a kinetic equation with evaporation, aggregation and breakage terms and compare the results with analytical solutions.

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