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宾汉流体稠密两相湍流流动中的二阶矩模型

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摘要: 建立的Bingham流体稠密两相流动的二阶矩-颗粒动力论湍流模型(USM-theta模型)既体现了两相的作用, 又体现了屈服应力所引起的附加项, 并提出了USM-theta模型下考虑浓度修正值影响的两相湍流流动的算法. 利用该模型对圆管内Bingham流体的单相湍流流动、稠密液固两相的湍流流动进行了计算, 并和五方程湍流模型进行了比较, 结果表明该模型的预测效果更好. 利用USM-theta模型对含颗粒的Bingham流体的两相湍流流动进行了模拟, 随着屈服应力的增加, Bingham流体相与颗粒相在管道中心附近的主流速度减小. 液固两相湍流和Bingham流体两相湍流的计算结果表明屈服应力引起的附加项对流动有很重要的影响.

关键词: Bingham流体; 两相流; 屈服应力; 二阶矩模型

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