迷宫流道内沙粒-壁面碰撞模拟与PTV实验 Simulation and Experimental Analysis on Sand-wall Collisions in Labyrinth Channel Emitter

葛令行 魏正英 唐一平 吴松坡 卢秉恒

西安交通大学

关键词： 灌水器 迷宫流道 堵塞 碰撞反弹系数 粒子跟踪测速技术

摘 要： 以单个沙粒为对象，研究了沙粒与灌水器流道壁面的碰撞过程。采用计算流体力学CFD数值模拟方法，分析了沙粒与壁面碰撞反弹系数Rc对灌水器抗堵性能的影响。结果表明，反弹系数对灌水器抗堵性能影响较大。利用粒子跟踪测速技术PTV，观测了复杂迷宫流道内沙粒与壁面碰撞过程，测定了不同压力点下矩形流道的碰撞反弹系数，为灌水器数值模拟时反弹系数的设定提供了实验依据，从而可以更加准确评估灌水器抗堵性能。 The process of sand-wall collision was performed to analyze the relationship between the collision and clogging of labyrinth channel emitter. First, the effect of Rc on pass rate of sand was analyzed using the CFD method. It was found that Rc has a great impact on the anti-clogging characteristics of labyrinth emitter and should be determined through experiments. In order to provide the experimental basis for the setting of sand Rc in numerical simulation, experiments of PTV were carried out for the determination of Rc under various pressure and different structure of labyrinth channel emitter, so that the anti-blocking performance can be more accurately evaluated.

查看全文（请使用Adobe Acrobat 6.0版本浏览） 返回首页 引用本文