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研发、设计、测试

基于OpenGL的静电喷涂雾化动画实现

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摘要 通过对静电涂油机喷涂雾化的基本理论分析，模拟了油液在高压静电场中经过荷电区、射流区、波纹区、雾滴区和雾滴扩散区的动态雾化效果。结合粒子系统的基本思想，以射流长度和雾化角作为宏观特性描述了油液的雾化情况，使用Visual C++结合面向对象技术和OpenGL图形库，根据所建立的数学模型，模拟了不同电压下油液的静电雾化形态。将程序模拟图片与实验中得到图像相比较，其仿真结果基本反映了静电喷涂中油液雾化的过程，与实验观察的效果基本相符，它为研制新一代静电涂油机提供了理论基础。

关键词 静电涂油机 开放性图形库 粒子系统 喷涂 雾化
分类号

Realization of atomizing animation for electrostatic spraying based on OpenGL

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Abstract
According to analyze the basic theory for electrostatic spraying atomization in electrostatic oiler，the effect of dynamic atomization is simulated when oil is in high voltage electrostatic field for running at the carrying charge area，jet area，waving area，fog drop area and fog drop diffusing area.Combing with the fundamental thought of the particle system，jet length and atomizing angle are described as macroscopic properties of oil atomization.Based on analyzing the oil atomization process and the created mathematical model，using Visual C++ and OpenGL library with object-oriented method，the shape of oil atomization under variable voltage is simulated.Compared with the pictures in the experiment，simulated result reflects the atomizing process of oil in electrostatic spraying elementally and it basically accords with the phenomena in experiment.So the theoretical basis is given for studying the pioneer electrostatic oiler.

Key words electrostatic oiler OpenGL particle system spraying atomization

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