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基于 **EFISH** 的电场测量及空间电荷极性效应研究

摘要

本文提出了一种具有高空间分辨率的基于电场诱导二次谐波效应（EFISH）的电场诊断系统，并将其应用于大气压电晕放电中电场空间分布的测量。通过实验研究了空间电荷极性对电场分布的影响。结果表明，在相同外加电压条件下，负极性电晕放电的电场强度明显低于正极性电晕放电。进一步结合空间电荷分布特性对该差异进行了理论分析和解释。

关键词

大气压电晕放电，电场测量，电场诱导二次谐波效应（EFISH），空间电荷极性效应

Abstract

In this study, we propose a high-spatial-resolution electric field diagnostic system based on the electric-field-induced second harmonic generation (EFISH) effect, and apply it to measure the spatial distribution of electric fields in atmospheric-pressure corona discharges. The influence of space charge polarity on the electric field distribution was investigated experimentally. The results show that, under the same applied voltage, the electric field intensity near the electrode in negative corona discharges is significantly lower than that in positive ones. This difference is further analyzed and interpreted based on the spatial distribution characteristics of space charges.

Keywords

Atmospheric-pressure corona discharge; Electric field measurement; Electric-field-induced second harmonic generation (EFISH); Space charge polarity effect

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