

# Electrohydrodynamics

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## Electrohydrodynamics

### **Electrohydrodynamic Stability - Duke University**

Electrohydrodynamic Stability Chuan-HuaChen\* DepartmentofMechanicalEngineeringandMaterialsScience, DukeUniversity,Durham,NC,USA  
Abstract ...

### **Electrohydrodynamics and dielectrophoresis in microsystems ...**

INSTITUTE OF PHYSICS PUBLISHING JOURNAL OF PHYSICS D: APPLIED PHYSICS J Phys D: Appl Phys 36 (2003) 2584-2597 PII:  
S0022-3727(03)63619-3 Electrohydrodynamics and dielectrophoresis in microsystems: scaling laws A Castellanos1, A Ramos1, A Gonzalez'  
1,2,NGGreen3 and H Morgan3,4 1 Dpto Electronica y Electromagnetismo, Facultad de F'isica, Universidad de Sevilla,

### **Hydrodynamics and Electrohydrodynamics of Liquid Crystals**

Hydro- and Electrohydrodynamics this is Chapt2 in: Pattern Formation in Liquid Crystals eds A Buka and L Kramer, Springer NY (1996)  
Hydrodynamics and Electrohydrodynamics

### **Electrokineticsmeets electrohydrodynamics**

electrohydrodynamics Martin Z Bazant† Departments of Chemical Engineering and Mathematics, Massachusetts Institute of Technology, MA, USA  
Diffuse layers Genuine interface Taylor Melcher interface Electro-osmotic flow Interfacial electrical stress Electric displacement Dominant  
electrohydrodynamic flow Apparent surface charge Electrical force

### **ELECTROHYDRODYNAMIC PUMPING PRESSURE GENERATION**

i Abstract Electrohydrodynamic (EHD) conduction pumping relies on the interaction between electric fields and dissociated charges in dielectric fluids

### **Numerical Investigation of Electrohydrodynamic Effect on ...**

Int J Advanced Design and Manufacturing Technology, Vol 7/ No 4/ December - 2014 79 © 2014 IAU, Majlesi Branch 2 THEORETICAL APPROACH  
21 Governing Equations

### **Electrical Characteristics and Electrohydrodynamic Flows ...**

Keywords: Electrostatic precipitator; Electrohydrodynamics (EHD); Vortex structure; Secondary flow; Discharge electrode NOMENCLATURE  $\epsilon_0$  permittivity of free space  $\epsilon_i$  permittivity of the  $i$ th dielectric  $F_i$  convective flux in the  $i$ th direction  $E_i$  electric field strength in the  $i$ th direction  $H$  height of corona electrode  $I$  specific current of discharge wire  $J$  average current density on the collecting

### **Application of Gerris to electroconvection problems**

Electrohydrodynamics (EHD) is an interdisciplinary area dealing with the interaction of fluids and electric fields and charges The electric charge can appear in the volume of the fluid (space charge) or on the surface interfaces between fluids (surface charge) The electric and velocity fields are coupled through the electrical forces

### **Electrohydrodynamics of a current-carrying semi-insulating jet**

Electrohydrodynamics of a jet 129 virtue of the stream conductivity, rather than permittivity The stability is, in part, a matter of the normal stress equilibrium, a view supported by a detailed analysis of the stability for perturbation from an equilibrium wherein there are no electrical shear stresses (Melcher & Schwarz 1968; Saville 1970)

### **10.626 Lecture Notes, Electrokinetics - MIT OpenCourseWare**

ionic liquids (reserving the term “electrohydrodynamics” for weakly conducting dielectric liquids) Here we examine the basic electrokinetic equations for electrolytes, as well as several types of electrokinetic phenomena 1 Basic Equations

### **Recent advances in electrohydrodynamic pumps operated by ...**

Keywords: ionic wind, corona wind, electric wind, electrohydrodynamics 1 Introduction The ionic wind is one of the more interesting natural phenomena in plasma science First observed centuries ago [1], it is an inherent byproduct of gas discharges at high pressure, and the physics, in principle, are very simple: ions accelerated by

### **A Convection-Conduction Model for Electrohydrodynamic ...**

Index Terms—Electrohydrodynamics, electromagnetic forces, fluid flow control, finite volume methods I INTRODUCTION Dynamic droplet processes under the influence of strong electric fields play an important role in many technical applications The perhaps best known example is electrospraying [1], [2]

### **A charge-conservative approach for simulating ...**

Electrohydrodynamics (EHD) describes the motion of liquids subjected to electric fields Typically the liquid will be set in motion by electrical stresses, thereby modifying the geometry and charge distribution, which in turn modifies the electric field Under the influence of an electric field two

### **Direct Electrohydrodynamic Simulation of Particle Mobility**

mobility, ie concentration of co- and counter-ions, the electric field, fluid flow, electrical forces and drag forces Conclusion: Electrophoretic mobility of particles is an important but complex

### **Modeling studies and numerical analyses of coupled PDEs ...**

Electrohydrodynamics (EHD) is the term used for the hydrodynamics coupled with electrostatics, whose governing equations consist of the electrostatic potential (Poisson) equation, the ionic concentration (Nernst-Planck) equations, and Navier-Stokes equations for an incompressible,

viscous dielectric liquid In this dissertation,

### **The incorporation of electrohydrodynamics and other ...**

electrohydrodynamics (as a mechanism for fluid movement) coupled with very high solvent evaporation rate behavior contributed to a new and representative description of the extreme case of filament diameter reduction inherent in the electrospinning process

### **Brian J. Vallelunga J0131**

Levitation: Applied Electrohydrodynamics J0131 Objectives/Goals The scientific exploration of unconventional flight is exciting and full of surprises This science project explores the relationship between thrust and voltage of an asymmetric capacitor as a means of generating thrust

### **[hal-00908724, v3] Visco-potential flows in ...**

VISCO-POTENTIAL FLOWS IN ELECTROHYDRODYNAMICS MATTHEW HUNT AND DENYS DUTYKH Abstract In this study we consider the problem of the interface motion under the capillary{gravity and an external electric force The infinitely deep uid layer is assumed to be viscous, perfectly conducting and the flow to be incompressible The weak viscous

1. [PDF]

## [On the Fabrication of Microparticles Using](#)

*dspacemitedu/bitstream/handle/17211/7480/MEBCS009pdf*

Secondly, the **electrohydrodynamics** of the thin jet under the influence of surface charges and axial electrical field are relatively well developed and thus we are able to predict the trend of the process III RESULTS AND DISCUSSION A Phase Doppler Particle ...

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