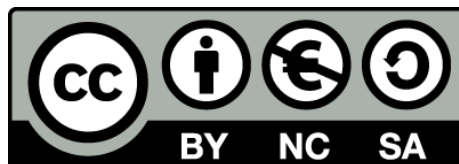




Electric polarization properties of single bacteria measured with electrostatic force microscopy

Theoretical and practical studies of Dielectric constant of single bacteria and smaller elements

Daniel Esteban i Ferrer



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UNIVERSITAT DE BARCELONA



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Barcelona, September 2014

DOCTORAL THESIS

11 Appendix

11.1 Acronyms

Abbreviation	Description
AC	alternating current
AFM	atomic force microscopy / microscope
C-AFM	conductive atomic force microscopy
CS-AFM	current sensing atomic force microscopy
DC	continuous current
EFM	electrostatic force microscopy
KFM	kelvin force microscopy
NIM	nanoscale impedance microscopy
SCM	scanning capacitance microscopy
SEM	scanning electron microscopy
SFM	scanning force microscopy
SPM	scanning probe microscopy
STM	scanning tunneling microscopy
HOPG	highly oriented pyrolytic graphite
SMM	scanning microwave microscopy

11.2 Publications and congress presentations

Publications

L. Fumagalli, G. Gramse, **D. Esteban-Ferrer**, M. A. Edwards, and G. Gomila

Quantifying the dielectric constant of thick insulators using electrostatic force microscopy

Applied Physics Letters 96, 183107, 2010

L. Fumagalli, **D. Esteban-Ferrer**, A. Cuervo, J. L. Carrascosa and G. Gomila
Label-free identification of single dielectric nanoparticles and viruses with ultraweak polarization forces

Nature Materials 11, 808-816, 2012

D. Esteban-Ferrer, M. A. Edwards, L. Fumagalli, A. Juárez and G. Gomila
Electric Polarization Properties of Single Bacteria Measured with Electrostatic Force Microscopy

ACS Nano Epub, ahead of print, 2014

G. Gomila, **D. Esteban-Ferrer** and L. Fumagalli

Quantification of the dielectric constant of single non-spherical nanoparticles from polarization forces: eccentricity effects.

Nanotechnology 24 (50), 505713, 2013

D. Esteban-Ferrer and G. Gomila

Methodology for three-dimensional dielectric characterization

In preparation

D. Esteban-Ferrer and G. Gomila

Theoretical methodology for single bacteria dielectric characterization

In preparation

Congress presentations

D. Esteban-Ferrer, A. Juárez and G. Gomila

Electric Polarization Properties of Single Bacteria Measured with Electrostatic Force Microscopy (poster)

Assylum AFM bio, Nancy, 2008

D. Esteban-Ferrer A. Juárez and G. Gomila
Nanoscale Impedance Microscopy on single bacteria. A theoretical study (poster)

Trends on NanoTechnology (TNT), Barcelona, 2009

D. Esteban-Ferrer, MA Edwards, A. Juárez and G. Gomila
Single bacteria studies. Bioelectrical characterization of single Salmonella cells (poster)

Nano Bio, Zurich, 2010

D. Esteban-Ferrer M.A. Edwards, L. Fumagalli, A. Juárez and G. Gomila
Single bacteria recognition using electrostatic force microscopy (oral presentation)

International AFMbiomed, Paris, 2011

D. Esteban-Ferrer M.A. Edwards, L. Fumagalli, A. Juárez and G. Gomila
Single bacteria studies using Electrostatic Force Microscopy (oral presentation)

Ibec PhD seminars, Barcelona, 2011

T. Wiegand, **D. Esteban-Ferrer**, H. Huttener, A. Juárez and G. Gomila
Immobilization of viable Bacteria for AFM imaging (poster)

Ibec Symposium, Barcelona, 2012

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