



ΣΕΜΙΝΑΡΙΟ ΚΕΝΤΡΟΥ ΚΒΑΝΤΙΚΗΣ ΠΟΛΥΠΛΟΚΟΤΗΤΑΣ & ΝΑΝΟΤΕΧΝΟΛΟΓΙΑΣ/
CCQCN SEMINAR

Friday, 13 December 2013

10:30-11:30

1st Floor Seminar Room

Columb's Law in Anisotropic Media

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Abstract

Coulomb's law in vacuum or in isotropic, dielectric media has been well known since the early 19th century. The electrostatic potential for a point charge falls off like $1/r$, producing a radially polarized electric field and displacement current. In anisotropic media the electrostatic potential also has a close-form solution. For this solution, the concept of a pythagorean distance is generalized to an "anisotropic distance". This anisotropic distance yields an electrostatic potential with ellipsoidal equipotential surfaces and an electric field that is distorted from the radial direction by the tensor-valued, anisotropic permittivity. At the same time, the displacement current remains purely radially polarized. The exact solution of Coulomb's law is generalized to a spherical-harmonics solution for compressional acoustic waves in elastic media and to a Yukawa-like solution for compressible fluids in Darcy-style flow in porous media.

