

Zajednički seminar

Znanstvenog centra izvrsnosti QuantiXLie,
Matematičkog odsjeka i Fizičkog odsjeka

Rolf Schuhmann

Theoretische Elektrotechnik, TU Berlin

Enhanced Eigenvalue Formulations in Electromagnetic Field Simulation for Microwave and Optical Applications

Eigenvalue formulations for the electromagnetic wave equation in frequency domain have been investigated for many decades now, and can actually be considered as one of the earliest motivations to develop efficient numerical simulation tools. Dealing with three-dimensional problems with complicated geometrical shapes, the most commonly used discretization approaches are Finite Differences, Finite Integration, and Finite Element methods. As volume grid-based techniques they share many of their major properties, but also have some important differences with respect to both practical issues in applications and the resulting algebraic formulations.

The presentation will shortly review some basic properties of these methods and discuss their relation to practical issues in modelling typical EM eigenvalue problems. In the main part, some extensions are presented to handle more challenging setups, such as dispersive material models, cavities with radiating boundary conditions, or geometrical parameter variations. Along with the extended eigenvalue formulations, corresponding enhancements are required for the algebraic solvers in order to guarantee an efficient and robust overall simulation process.



Znanstveni centar izvrsnosti
za kvantne i kompleksne sustave te
reprezentacije Liejevih algebri

Projekt KK.01.1.1.01.0004

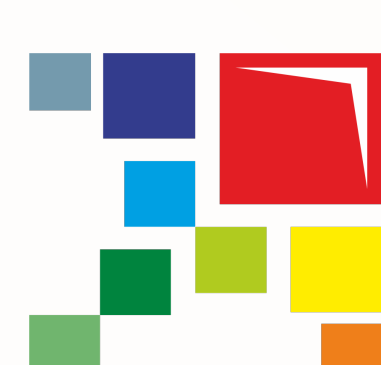
Projekt je sufinancirala Europska unija iz
Europskog fonda za regionalni razvoj.
Sadržaj ovog seminara isključiva je
odgovornost Prirodoslovno-matematičkog
fakulteta Sveučilišta u Zagrebu te ne
predstavlja nužno stajalište Europske unije.

Četvrtak, 21. 3. 2019., 12:15h

Matematički odsjek, predavaonica 104



Europska unija
Zajedno do fondova EU



Operativni program
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