G. Vecchi (POLITO (ID 20))

Involved institutions

Universita degli Studi di Siena

IETR INSTITUT D'ÉLECTRONIQUE ET DE TÉLÉCOMMUNICATIONS DE RENNES

Name of the course

Computational EM for antenna analysis

Type			
M	D	A/D	A
			■

Place

POLITO-Torino
This course is organized jointly with the Italian Electromagnetic Society (SIEM)

Date: 19-23 September

Summary (2000 words)

Review of MoM fundamentals. G.Vecchi (3 hours):

- Integral-Equation formulation
- MoM as weighted residuals
- div-conforming bases, low order (RWG and rooftop); implementation details
- Source modeling basics (voltage gap)
- Extension to stratified media
- Review of existing convergence results
- Roadmap to advanced topics

Higher order basis function methods. R.Graglia, R.Mittra, G. Vecchi, S.Maci (6 hours):

- Higher-order polynomial functions
- Aggregate functions: strategy, implementations

High-density mesh problems. G.Vecchi (2 hours):

- "Low-frequency" issues and their relevance in antenna modeling
- Mesh-related issues: loop-star decomposition (and limitations)
- Source modeling: variational source modelling

Fast methods. A. Freni (6 hours):

- Overview of fast methods
- Fast multipole method (FMM)
- Conjugate-Gradient FFT (CG-FFT)
- Adaptive integral method (AIM)

Multi-resolution methods. R. Loison, G. Vecchi (4 hours):

- Introduction to multiresolution (MR) analysis
- Multiresolution and MoM for the fast computation of printed antennas
- MR-MoM for 3D structures

Attendees willing to participate actively in practical sessions are asked to come equipped with a laptop; a WiFi connection card is preferred

Structure of the course

Lectures	Experimental labs.	Computer and/or assigments	Total	Credits	Assessment typology
21 hours		16 hours	37 hours		Attendance: 1 cr Assignements: +1 cr

Teachers

Name	Organization	Title
G. Vecchi	POLITO	Prof.
R. Graglia	POLITO	Prof.
A. Freni	UNIFI	Prof.
S. Maci	UNISI	Prof.
R. Loison	IETR	Prof.
R. Mittra (Special guest)	PennState University	Prof.

Availability of dedicated structures

College rooms		Dedicated Labs		Classrooms		Computer rooms		Canteen	
yes	no	yes	no	yes	no	yes	no	yes	no
	■		■	■		■		■	