



3RD WORLD CONGRESS ON

Microwave & Radio Frequency Applications

Bridging Science, Technology & Applications

22 - 26 SEPTEMBER 2002

SYDNEY CONVENTION & EXHIBITION CENTRE, SYDNEY, AUSTRALIA

Workshop on Electromagnetic Modeling for Microwave Processing

Tutors: W. Gwarek and V. Yakovlev

A G E N D A

8:30 – 9:00: Installation of *QuickWave-3D* on the participants' laptops

1. Basics in Computational Electromagnetics and Modeling of Microwave Heating

9:00-9:10: Introduction to the course. (VY)

9:10-9:50: Review of numerical methods of EM modeling. Advantages of FDTD over FEM, discretization, why time domain, finite differences in time domain, conforming to curvilinear surfaces, etc. Error analysis. (WG)

2. Overview of EM Simulators & Special Regimes of Modeling

10:00-10:25: Database of EM software applicable to modeling of microwave heating. Test problem solved by different simulators. (VY)

10:25-10:50: Special models and algorithms: absolute and average values of the field, average heating patterns, varying media parameters, freeze of state of the EM simulator, load rotation/shift, etc. (WG)

3. Simulation with *QuickWave-3D*: What's and Why's & User's Resources

11:00-11:30: Computational strategy of FDTD modeling of microwave heating. Examples of practical use of the strategy: conceptual and technical issues. (VY)

11:30-12:00: Practical work with *QuickWave-3D*: elements and objects, building scenarios out of parameterized libraries, import of CAD files, modal excitation, post-processing, etc. (WG)

12:00-13:00: L u n c h

4. Examples of Modeling

Illustrations of modeling of practical scenarios: live demonstration of *QuickWave-3D* simulations – cavities, closed and open structures, and other applicators.

13:00-13:30: Heating of frozen and defrosted beefburger in a domestic oven. (WG)

13:30-14:00: Power dissipated in a cylindrical body as a function of wave polarization. (WG)

14:00-14:15: Microwave drill: scenario with radiation. (VY)

14:15-14:30: Glass bulb overheating in a high-power coax-to-waveguide transition. (WG).

5. Practical Issues in CAD with *QuickWave-3D*

14:30-15:30: Simple tutorial examples. Options in optimization of microwave structures. Building the models and running simulations for the applied problems (including suggested by the participants). (WG, VY).

15:30-16:00: General Discussion and Conclusion