RF 2005

The 7th International High Energy Density and High Power RF Workshop

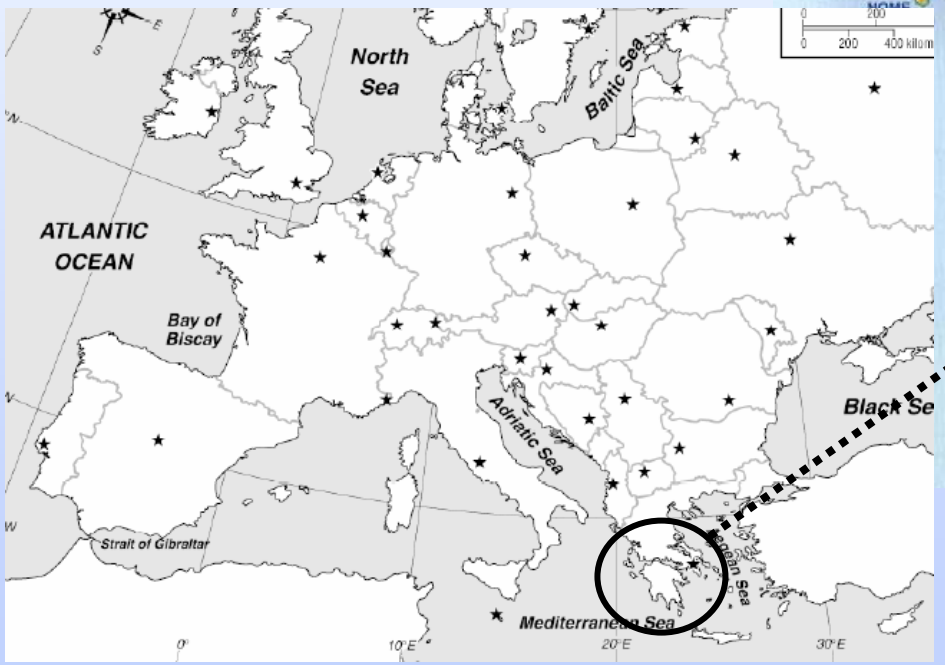
June 13-17, 2005
Kalamata, Greece

Sponsored by
DOE, AFOSR, Technical University Athens Greece

Organized by

J. Vomvoridis (Technical University of Athens and at the University of Athens),
G. Caryotakis (SLAC),
G. S. Nusinovich (Univ. Maryland)

Where in the world is Kalamata?



RF-2005 7th Workshop on High Energy Density and High Power RF
June 13-17, 2005, Kalamata, Greece

RF 2005 Workshop - Topics

- Opening Session (General Topics of Interest)
- Multi-beam and Sheet-beam Klystrons
- Gyrotrons
- Microwave and Millimeter Wave Devices
- THz Sources
- High Power RF Sources and Technology
- Poster Session
- Accelerator Systems

Opening Session

Chair: M. I. Petelin

8:30 Invited talk: On the preference of cold RF technology for the ILC

A. Gamp

9:00 Invited talk: Warm structures CLIC technology

E. Jensen

9:30 Invited talk: Physics of particle acceleration at very short wavelengths

T. Katsouleas

10:00 Invited talk: Traveling-wave undulators for FELs and synchrotron radiation sources

C. Pellegrini

10:30 Invited Talk: Overview of gyrotron-related research at the National Technical University of Athens and at the University of Athens.

J.Vomvoridis

Multi-beam and Sheet-beam Klystrons

Chair: B. Levush

11:20 Invited talk: Basic of radial sheet beam interactions with potential device applications in the microwave K and W bands
T. Wessel-Berg

11:50 Invited talk: MBKs and their utilization in complex microwave systems
E. A. Gelvich

12:10 Experimental performance of the NRL 8-beam, 4-cavity multiple-beam klystron
D. Abe

12:30 Technology progress on multi-beam klystron
Y. Ding

12:50 Mode coupling in sheet-beam klystrons
G. Nusinovich

1:10 W-band sheet-beam klystron design and test
G. Scheitrum

Gyrotrons

Chair: V. L. Bratman

5:00 Invited talk: Gyrotron development in EU for present fusion experiments and for ITER
M. Thumm

5:30 Invited talk: CPI gyrotrons for fusion EC heating and current drive.
H. Jory

5:50 Invited talk: Dynamics of axial mode competition in the gyrotron backward-wave oscillator
K. R. Chu

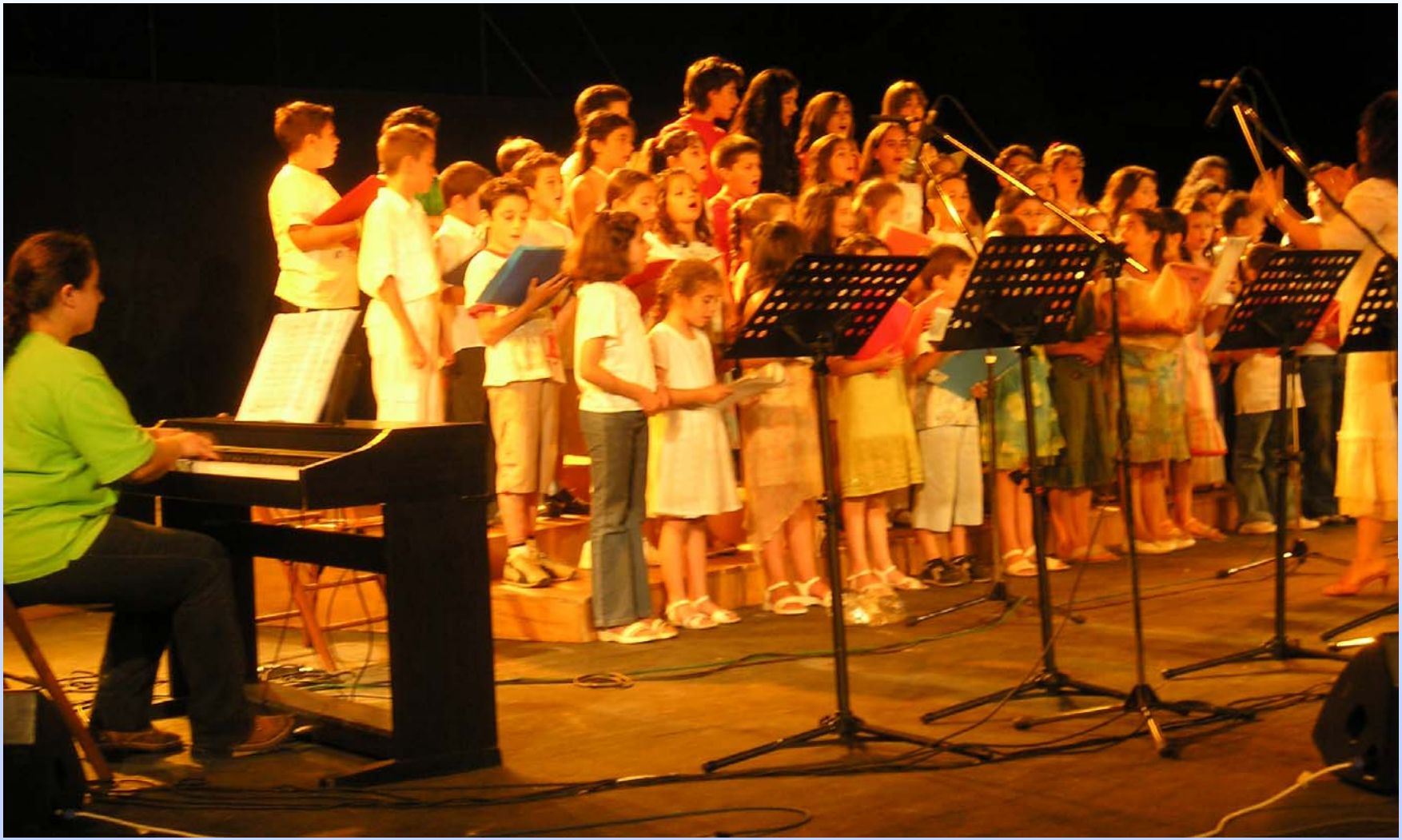
6:10 Invited talk: Development of an ultra high frequency gyrotron with a pulse magnet
T. Idehara

6:30 Azimuthal instability of gyrotron radiation
G. S. Nusinovich

6:50 UC Davis 94 GHz gyro-TWA development
N. C. Luhmann, Jr.

7:10 Dynamics and output momentum spectrum of electrons under harmonic resonance in gyrotron resonators
Y. Kominis

Mayor’s reception (Tues. eve) for RF-05 Workshop



Microwave and Millimeter Wave Devices

Chair: G. Scheitrum

8:00 Invited talk: Advances in the design codes for vacuum electron devices
B. Levush

8:30 Invited talk Two-step LIGA fabrication of mm-wave devices
G. S. Park

9:00 Invited talk: Roads to chaos in microwave circuits and devices
D. M. Vavriv

9:30 Mm-wave source development at Los Alamos
B. E. Carlsten

9:50 Co-axial Ka-band FEM using two-dimensional distributed feedback
A. D. R. Phelps

10:10 Microwave generation from an electron horseshoe distribution: theory and experiment
R. Bingham

THz Sources

Chair: T. Katsouleas

10:50 Invited talk: The Jefferson Lab Free Electron Facility
J. R. Boyce

11:20 Invited talk: Sources of coherent THz radiation
V. L. Bratman

11:50 Potentials of clinotrons for THz radiation
D. M. Vavriv

12:10 Novel THz radiation sources
P. Muggli

12:30 Tunable THz generation by the interaction of a super-luminous laser pulse with biased semiconductor plasma
D. Papadopoulos

12:50 Dielectric loaded wakefield structures for RF power generation
M. Conde

1:10 THz generation via GV/m Cherenkov wakefields produced in dielectric tubes
G. Travish

High Power RF Sources and Technology

Chair: S. Gold

5:00 Invited talk: Review and projections of research into High-Power and Conventional RF sources

Jack Agee

5:30 Invited talk: Latest results in SLAC 75 MW PPM klystrons

D. Sprehn

6:00 Invited talk: Progress in CPI microwave tube development

E. Wright

6:30 Invited talk: High-power millimeter- and centimeter-wave magnicons

O. Nezhevenko

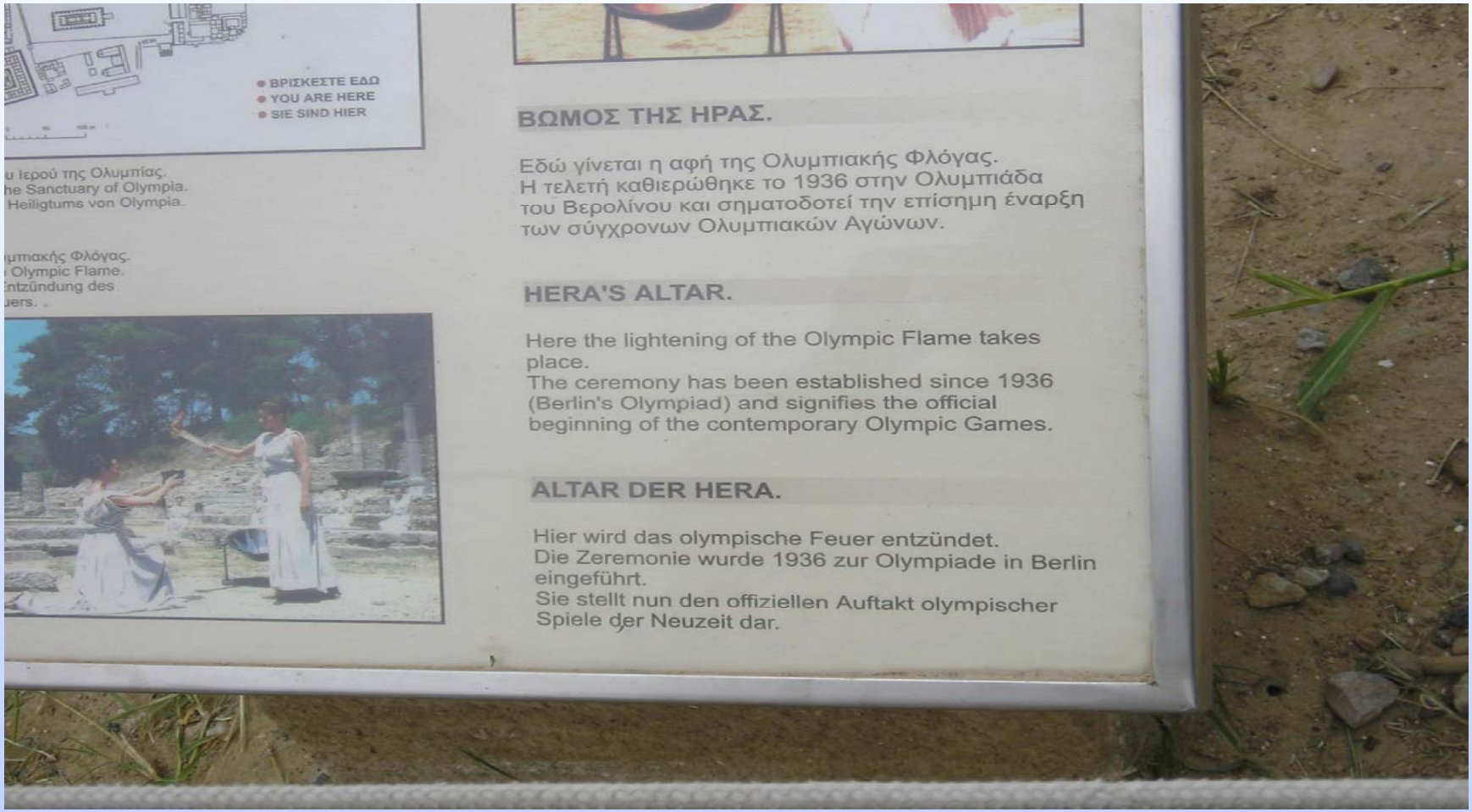
7:00 Improved Dispenser Cathodes

R. L. Ives

RF-2005 Banquet (Wednesday evening)

Tour of Olympia (Thursday morning)

Speaking of light sources…



Poster Session

Mm-wave magnetron transmitters for high-resolution radars	D. M. Vavriv
2) Study on efficient axial power extraction in a GW MILO	D. H. Kim
3) Investigation of the mm-wave plasma assisted CVD reactor	M. Caplan
4) CLIC 50 MW L-band multi-beam klystron	E. Jensen
5) MBK research at CCR	R. L. Ives
6) Design and test of a submillimeter-wave backward-wave oscillator	R. L. Ives
7) Beam optics analysis – an advanced 3D trajectory code	R. L. Ives
8) Recent advances in high emission scandate cathodes	Y. Wang
9) Investigation of W-Ir alloyed cathodes	Z. Yu
10) Investigation of thermionic cathodes nonuniform emission	Y. Gao
11) Wideband RF structure for mm-wave TWT	L. M. Earley
12) High average power tests of an S-band RF photoinjector	G. Travish
13) Electron pre-bunching for rapid startup and low noise in microwave magnetron by electron priming	G. S. Park
14) Experimental study on photonic crystal reflex klystron using cold cathode	K. H. Jang
15) Study of Ka-band high-power transmission lines	S. Kuzikov
16) Design of a compact multi-MW mode converter	V. A. Dolgashev
17) RF pulse compression using helically corrugated waveguide	A. Phelps
18) Design and simulation of a thermionic cusp-gun gyro-TWA	A. Phelps
19) Construction of a Ka-band cusp gun second-harmonic gyro-TWT amplifier	S. B. Harriet
20) Design and test of a 34 GHz peniotron	L. J. Dressman
21) Development of a 25 MW, 30 GHz gyroklystron	M. E. Read
22) Studies on the electromagnetic spectrum of corrugated waveguides	G. Latsas
23) Coaxial gyrotron cavities with resistive corrugated insert for powerful second-harmonic operation	K. A. Avramides
24) 3-Dimensional self-consistent electrostatic simulations of gyrotron beam tunnel assemblies	J. Gr. Pagonakis
25) Self-consistent post amplification of a gyrotron RF beam by a sheet electron beam	G. E. Anastasiou
26) Electron emission inhomogeneity and low-frequency parasitic oscillations in a gyrotron	G. Sominski

Accelerator Systems (Friday morning)

Accelerators and Systems I *Chair: J. Hirshfield*

8:00	Invited talk: Development of a dielectric-loaded accelerator test facility based on X-band magnicon amplifier	S. H. Gold
8:30	Invited talk: Components for quasi-optically fed linear accelerators	M. I. Petelin
9:00	Design of high gradient structure for CLIC	A. Grudiev
9:20	Recent measurements at the SLAC Compton X-ray source	A. E. Vlieks
9:40	30 GHz high power production for CLIC	I. Syratchev
10:00	Selective coupling using patterns of perforations between modes of oversized structures	M. I. Petelin

10:20 – 10:40 ***Coffee break***

Accelerators and Systems II *Chair: I. Syrachev*

10:40	RF systems of the ILC	S. G. Tantawi
11:00	Development of an ultra-fast silicon switch for active X-band high power	S. G. Tantawi
11:20	Experiments on active high-power RF pulse compression at X-band	J. Hirshfield
11:40	Resonant microwave pulse compressors	J. Hirshfield

12:00 Close-out

Summary Remarks

- Good workshop – Surprising number of exotic RF being researched
- Conference conducted in English – kudos to attendees and presenters for whom English is not first language.
- ~ 50 Attendees with ~ 75 talks & posters

  (RF 2003 had 70 Attendees and 50 talks & posters)
- Sessions started at 8 a.m. and activities usually ended after midnight.
- SRF has a theoretical limit of 50 MV/m. Warm technology or more exotic means will be needed for next generation accelerators
- I presented invited talk: "The Jefferson Lab Free Electron Facility"
  - Well received, especially the tunability and 3 simultaneous photons.
- Thanks to R. Walker, G. Neil, and F. Dylla for sending me.

The 1st University, Plato, Socrates, & Boyce

RF-05 Trip Report: “Kamp Kalamata”*

(To the tune of the camp song “Hello, Mother, Hello, Father”)

1. Hello, Mother, Hello, Father,
   Here I am at Kalamata
   I’m attending an RF workshop
   We start at 8 and all day long the talks go non-stop

2. First, Al gave us all the reasons
   The I-T-R-P’s final decision
   Cold RF was recommended.
   SLAC contingent said this choice was less than splendid.

3. But then Glenn Scheitrum, he got so upset
   Our Power Point talks, would not project
   You see, Glenn’s PC chose then to abort
   And his luggage didn’t make it from the airport.

4. The call went up for volunteers
   I said my laptop would calm their fears
   Plugged it in and things were clear
   Guess what? Now I’ve got all their talks in my laptop!

5. Backward wave oscillators
   Multi-beam accelerators
   Calculations, experimentations
   Talks in English but from, oh, so many nations.

6. In the evening there’s entertainment,
   Local dancers in costume raiment
   Plus a chorus of children charmed us
   And we prayed that all that Ouzo wouldn’t harm us.

7. Kate and Lynette are now exhausted
   They’ve earned the title “Cat Herders Exalted.”
   George is saying this is his last one
   They’re now searching for a sucker for the next one.

8. My trip report now is done.
   RF-Oh-five was a lot of fun
   I bought olives in a duty free shop.
   But I now find them on isle three down at Ukrops.