

~~reconvened at 9 AM for the
annual meeting~~

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Finite Element Circus Meeting
University of Michigan
April 17-19, 1980

Beautiful spring weather greeted the circus members as they arrived in Ann Arbor for the Spring meeting of the circus hosted by Mitch Lustkin and Rick Scott.

The sessions were held at the East Engineering Building on the University of Michigan campus with

26 circus members attending and 19 presenting talks.

Following 13 talks on Friday Barb and Mitch Lustkin graciously hosted a party at their home. The group then moved to the Hung-wan restaurant for an excellent Chinese dinner. Saturday the group

reconvened at 9: A.M. for the remainder of the talks.

As previously decided, the Fall 1980 meeting of the circus will be held at Rutgers University.

Continuing our tradition, R. Falk presented the following:

There is a fine fellow named IVO,
whose circus is quite a good show.
though there's no flying trapeze,

For solving P. D. E. S,

IVO's circus is the place to go.

Ridgway Scott
Mitchell Luskin
James Douglas Jr.
Dick Ewing
Jean Roberts
Randy Bank
Bill Hager
F. Tinsley Oden
Todd Dupont
Brad Lucier
Jo Bosak
John Osborn
Peter Sammon
Tom Russell
Douglas N Arnold
Michael Vogelius
Rolf Rannacher
Charles Goldstein

Bertrand Mercier
Olof Widlund
David B. Wahlbin
William D. Roitman
Rick Falk
Jim Bramble
Q.K. Ong
RuhB
Dabon Kikuchi

R. Scott, DISCONTINUOUS PIECEWISE POLYNOMIAL APPROXIMATION OF PLASTICITY PROBLEMS

M. Luskin and R. Rannacher, On the Smoothing Property of the Galerkin Method for Parabolic Equations

Jain Douglas, Jr., Simulation of Miscible Displacement

R. Bank & D. Rose parameter selection for Newton-like methods

W. HAGER, Semi-dual approximations in optimal control.

J.T. Oden, RIP-methods (Reduced-Integration Penalty) for Contact Problems in Incompressible Elasticity

T. Dupont, Mesh modification and inconsistency

J. PASCIAK, FOURIER METHODS FOR BBM WITH PSEUDO DIFFERENTIAL OPERATORS

J. Osborn, An Observation on mixed methods

T. Russell, Combining finite elements with the method of characteristics for a miscible displacement problem

R. Rannacher: On the f.e.a. of Navier-Stokes problems.

B. Mercier: Polynomial spectral methods for the advection equation.

O. WIDLUND: Remarks on ~~part~~ potential theories.

L. B. Wahlbin, Stability of H^1 projections (joint
with A. H. Schatz)

D.N. Arnold, Reduced Integration in the Finite Element Method

Michael Vogelius Approximation by polynomials.

I Babuska High order Finite Element
Method

Charles W. Müller
The Finite Element Method
with Non-Uniform Mesh
size for Linear Helmholtz
Problems

J. H. Bramble, The efficient solution of Babuska's
multiplier method for Dirichlet's
problem and Falk's multiplier
method for the first biharmonic
boundary value problem.

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Finite Element Circus Meeting
Rutgers, The State University

Nov. 14-15

The circus convened at Rutgers in fine fall weather. The meetings were characterized by excellent snacks, a fine cocktail party at the Falks, and a leisurely schedule of talks. There were 32 attendees and ~~12~~¹² speakers. The following poems were contributed

a Swedish Haiku

CREATE!

In computing chaos
an ANCHOR, and

Dancing Differentials

(L. Wahlbin)

Nostalgia

when I think back on the events
over these past ten years,
I recall the great accomplishments,
tho' of course I've had his FEARS.
I never forget there were times
when the coefficients get rough.
But we always get at least $O(h^{1/2})$,
and for me that's close enough.

(R. Falk).

Paul Vojta
John J. Gray
Randy Bank
Adam Kibuchi
L. Stanley Oder
Mary Janett Whelchel
Michael B. Butterman
Steve Berlin
Kale E. Jordan
Mitchell Sustik
David A. Dye
Gerard Bucher
Andrea Morawski
Antonios Gerasoulis
E.C. Paolini
Zhang Jian Sheng

attendees

Bruce Kellogg
Dick Ewing
Rick Faik
Jim Bramble
Joe Poucha
Todd Dupont
Michael Vogelius
Linda J. Hayes
Randy Bank
Deonne Kikuchi
L. Tinsley Oden
Mary Janett Wheeler
Michael B. Breitman
Steve Berlin
Kirk E. Jordan
Mitchell Luskim
Abdul K. Ozis
Gerard Richter
Andrzej Mroczanski
Apostolos Gerasoulis
E.C. Paicer
Jiang Jin sheng

Dans B. Wahlbin
William D. Kotata
Stephen Leventhal
Garth Baker
D. A. Douglass
Peter Monk
John Douglas Jr.
Douglas H. Arnold
Peter Jammon
Joe Poucha

Titles

Kellogg : Finite element method for a scattering problem (w. A. Aziz, M. Dorr)

Bramble : — " —

Dufont : An analysis of Moller's Moving Finite Element Method in 1-d

Vogelius : Dimensional reduction vs. Asymptotic Expansion. Treatment of boundary-layers

Kikuchi : Penalty-Finite Element Approximations to Stokes' Problems (Joint: J.T. Oden)

Berger : Error Analysis for a Variable Mesh Tridiagonal Difference Scheme for a Singular Perturbation Problem

Luskin : Analysis of a Fractional Step Method for the Gas Pipeline Equations (Joint with B. Temple)

Wahlbin : A Remark Concerning Stress Intensity Factors. (Joint with A.H. Schatz)

Babuska The ρ and ν version. Results and robustness with respect to the Poisson ratio.

Douglas Finite difference-method of characteristics procedure for inelastic displacement

Arnold: Numerical solution of the Korteweg-de Vries
equation

Sympoz: Finite Element analysis of Upwinding
for a stiff convection diffusion equation.

Buraki Methods for magnetostatic field computation

Finite Element Circus

v

University of Maryland

February 20, 21, 1981.

A "Welcome Finite Element Circus" sign greeted the members as they arrived at the Quality Inn in College Park, sight of the Spring circus. After 15 talks on Friday, the Babuškas graciously hosted a cocktail party at their home, after which we had an excellent dinner at the China Garden restaurant. On Saturday, seven additional talks completed the meeting.

Attendees
Mass.

Todd Dupont
Matthew Luskin
Peter Jammon
Richard Falk
Douglas N Arnold
Graham F. Carey
Howard Han
John Bell
Alan Berger
Stephen Leventhal
~~Lorraine Manzi~~
Peter Perrell
Howard Burkman
Dick Ewing
Joel Rogers
Shaqi - R. Shih
Dick Morgan
Camille D'Innunzio
Uday Banerji
William Sypryanoff
Michael Buterman
John Osborn
Roger Gemam
A.K. Aziz
Bill Hager
Alan Weiser
Tom Russell
~~J. Tinsley Oden~~
Michael Vogelius
~~Zinda S. Wags~~
Mary Faure Wheeler
~~John Douglas Jr~~
Steven M. Serbin
Jean E. Roberts
~~J. L. L. J.~~
~~J. L. L. J.~~
J. Kirsch
A. Schatz
V. Dongali
D. KaraKoshian
Randy Bent
Joseph Posada

Peter Sammon - Some Regularity Theory for a Miscible Displacement Problem in Porous Media.

Richard Faire - A F.E.M. for the Simply Supported Plate Problem

DN Arnold - On the stability of Galerkin projections with different trial and test spaces

Graham Carey - Adaptive mesh and variable order upwinding for convection dominated flows.

Houde Han - A discretization scheme for singular perturbation problems (with R. Kellogg)

John Bell - A Variable Mesh Error Estimate for The El-Mistakawy-Wale Exponential Scheme for $\epsilon u_{xx} + b(x)u_x = f(x)$

Dick Ewing - Efficient Time-stepping Procedures for Miscible Displacement Problems in Porous Media using Mixed Methods for Darcy Velocity

Randy Bank - Computing error estimates for adaptive refinement schemes

Charles Goldstein - A Finite Element Method for Solving Helmholtz Type Equations in Parcels and Other Unbounded Domains.

Milo Dor - Weighted Space Approximation

John Osborn - Approximation of the solution
of equations with rough coefficients

Alan Weiser - On finite element methods
which locally adapt both
mesh size and polynomial degree

Tom Russell II - Multistep Galerkin methods
along characteristics for convection-diffusion
problems; some miscellaneous oil industry problems

A problem in homogenization. - Michael Vogelius

Zindar! Skys - Implementation of interface
boundary conditions in time dependent
problems.

Steve Serbin - A Fourth-Order Nonlinear Analogue
of the Baker-Gramble Scheme

Babuska FEAS, State of art

J. Hiptke : L_∞ -norm bounds of
Rif-operators

A Schatz : Singular Function methods.

V. Dorganis 2nd + 3rd order backward differentiation
methods for the Navier-Stokes equations

Bill Hager - Dual Approximations

Joe Pasciak - Approximation of Magnetostatics
Problems.

The Maryland Circus

when the circus comes to Maryland
it's always a special treat.

We lunched at what Our magazine calls
"a place that can't be beat."

Before dinner they hosted a great party
with unlimited alcoholic consumption.

But the highlight was my fortune cookie.

It said: You will need an
impressive assumption.

Tuncel et al.

Finite Element Circus
University of Texas
October 30-31, 1981

Linda Hayes and Tinsley Oden hosted the fall, 1981 meeting of the circus, held at the University of Texas. Continuing the tradition of unique dining experiences (last time a Texas barbecue at Coupland, Texas), the 31 participants enjoyed a dinner cruise on Friday evening.

On Saturday, 6 talks were given, making a total of 17 for the meeting. Continuing another tradition, Al Schatz, the last speaker, communicated results so recent that the proof of the main result was first discovered by Al during the last half of his talk.

Attendees

BchE

Frida J. Hayes

Jean E. Roberts

Dick Curing

Tom Russell

Steve Serbin

John Douglas Jr.

Edward Bonpland

Dr. Yanal Taha, I.O. Lamb

Mary Janett Wheeler

Jerome Taffee

Eric B. Becker

Jerry Fine

Olivia-Pierre Lagacette

Ramachander Krishnan

Mehmet Utku

Alfred Schatz

Houde Han

B. Kellogg

Groben Carey

John Osborn

Dave Malhus

Mitchell Lusk

Bill Hager

Tony Miller

Karen Hager

David Young

Murray Cantor

Douglas N Arnold

Rick Fark

Wesley Odell

T. illes

Babuska Grisvard FEM

Roberts - Compressible Miscible Displacement

Russell - Linear convection-diffusion equation (joint with R. Ewing) and miscible displacement by FEM with characteristics: numerical results

Douglas - Numerical solution of a nonlinear hyperbolic integro-differential equation arising in the description of the contraction of a muscle

Wheeler - Some numerical results for mixed methods

JAFFRE - Simulation of two-phase displacements by using mixed finite elements

Schatz : On singularly perturbed Reaction-Diffusion equations (the Finite element method).

Han : The finite element method for a singular perturbation problem using enriched subspaces (with R. B. Kellogg)

Kellogg : a) a density result used in scattering problems (with A. K. Aziz, M. R. Dorr)
b) singular perturbation 2 pt. b.v.p. with turning point (with A. Berger, H. Han)

Caey: Stability of Penalty FEM for Stokes Flow.

Osborn: Eigenvectors approximations by mixed methods

Jaschen: On the smoothing property of the Crank - Nicolson Method (joint with R. Rannacher)

Milner: On some a' posteriori error estimates

Cantor: Solution of Potential Type Equations on \mathbb{R}^3

Arnold: Spline Collocation for Elliptic PDEs on Curves

Hager: Dual Approximations

On Friday evening the Hager's had a cocktail party at their home, after which the group went to the lovely Penn State Boathouse in Boalsburg, for dinner.

Our Saturday discussion was briefly interrupted by a fire drill. Members stayed at the Giant Nittany Lion Hotel and the meeting was held in the Keller building on the Penn State campus.

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Finite Element Circus

Pennsylvania State University

April 16-17, 1982

Bill HAGER Hosted the Spring 1982 Circus Meeting in State College, Pennsylvania. There were 22 circus members in attendance and 13 gave presentations. The meeting was conducted at a leisurely pace with nine talks on Friday and four talks on Saturday. Jim Douglas was the Acting 'Ring Master' due to the absence of Ivo Babuska.

On Friday evening the Hager's had a cocktail party at their home, after which the group went to the lovely Historic Boalsburg Tavern in Boalsburg, Penn. for dinner.

Our Saturday discussion was briefly interrupted by a fire drill. Members stayed at the quaint Nittany Lion Hotel and the meeting was held in the Keller Building on the Penn State Campus.

Jinda Hager

ATTENDEES

John Douglas

Wendell H. Mills

Dick Ewing

Tom Russell

Charles Goldstein

John Osborn

Doug Arnold

Howard Richter

Kirk Jordan

Mark Friedman

Alfred Schatz

Larry Babes

Peter Mark

Max Sungbaze

Michael Vogelius

Karl B. Wahlbin

Michael Bieterman

Tony Miller

Randy Bank

Linda J. Hayes

Ty Olsen

Bill Hager

TACKS

Douglas - An alternating direction iterative method of David Brown for ~~the~~ mixed finite element methods

Arnold - Exponential convergence of a Spectral-Galerkin method for a boundary integral equation

Friedman - Numerical solution of the nonlinear magnetostatic problem

Schatz - singularly perturbed convection-diffusion problems.

Bales - A Fourth Order Time-Stepping scheme for Second Hyperbolic P.D.E.'s with time dependent coefficients.

Monk - A lagrange multiplier mixed finite element method for the simply supported plate problem

Vogelius - Bounding the inverse of the divergence operator on piecewise polynomials.

Wahlbin - Singularly perturbed reaction-diffusion problems.

Bieterman - An Adaptive space mesh modification in a method of lines for parabolic equations.

Miles - Finite Elst Soln of Term. constrained Opt Control Problem governed by Parabolic PDE's,

Miller - Calculation of Stress Intensity Factors

Bank - computable error estimates for adaptive refinement

Olsen - Posterior processing of penalty method solutions of Stokes problem

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Finite Element Circus
University of Chicago
November 5-6, 1982

The circus members were greeted by the first freezing weather and snow flurries of the winter '82. Jim Douglas hosted the circus meeting and served as ring master owing to Ivo having the Flu. The circus opened at 9 AM Friday morning in the Center for Continuing Education on the University of Chicago campus. The circus moved to the MATHEMATICS building for talks on FRIDAY AFTERNOON and Saturday morning. In total, 21 TACKS were given. We were treated to a fine lunch of prime rib AT the FACULTY Club on Friday. Jim and Mary Lou Douglas had a very nice cocktail party AT their home, and the group had dinner AT MALLORY'S. Jim now has the distinction of being the first circus member to have a son or daughter give a tack.

We gathered in Chicago
to hear the progress that has been made,
To learn of the open problems,
and the new tricks of the finite element trade.

though Jim was a great stand-in
and we had our usual rhyme,
It's not the same old Circus
without Ivo keeping the time.

R. FALK

'82

ATTENDEES

Zeneta J. Hayes

Li Yunhua

Li Guangyu

Juan E. Lenton

Maria Cristina J. Squiff

David L Malbus

Falco Milner

Bill Hager

Steve Serbin

Ridgway Scott

Dick Ewing

Craig Douglas

Bill Symeak

Stephen Leventhal

Alan Berger

Sonia Maria Fidelis Garcia

Rick Tolk

John Asborn

Todd Rapert

Vassilios Dangalis

Charnes Karakashian

Jim Bramble

Dan B. Wallen

John Dohel

Peter Monk

Mauris Kelly

Cal a Zoo

Larry Bates

Mark Friedman (sat down Singh)

Jeff E. Lewis

Chaitan P. Gupta.

Jen Dongas Jr

Mitchell Suskin

Randy Sauer

Ty Olsen

Al Schatz

Carly A. de Moura

Deborah Bodenau

TALKS

Li Yunghua, A necessary and sufficient convergence condition for Galerkin Method.

Jean Saut - Finite Element Methods for the simulation of wave propagation in two dimensional inhomogeneous media

Felio Milner - A mixed finite element method for a nonlinear second order elliptic problem.

Bill Hager - Penalty Techniques

Steve Leibin - Some Cosine Methods for Second Order Systems of ODE's with Time-Varying Coefficients

Ridgway Scott - A family of velocity / pressure spaces for the Stokes equations

Dick Ewing - Use of finite elements for displacement simulation in porous media

Craig Douglas - Abstract Multi-Grid Methods

Bill Symmaz - an adaptive finite element method for convection diffusion equations

Alan Berger - On the Behavior of the Exact Solution and the Error in a Numerical Solution of a Boundary Turning Point Problem

Rick Falk: A parametrization method for the stationary Stokes Equations

Vassilios Dougalis: High order (Runge-Kutta type) fully discrete methods for the Korteweg-de Vries equation

Lars B. Wahlbin: Pollution Effects from
reentrant corners; Proofs!

Larry Bales - Semidiscrete and Single Step
Fully Discrete Approximations for
Second Order Hyperbolic Equations
with Time Dependent Coefficients

Mark Friedman (Satnam
singh): On the properties of single layer potential for
Lipschitz boundary.

CHAITAN P. GURTA : - L_2 and Negative Norm estimates for
2-dimensional elasticity problem using
mixed method.

Jim Douglas Jr - Mixed finite element methods for 2nd
order problems

Mihell Fuki: On the variable penalty
method for the Stokes equation
(with H. Keshgi)

Alfred Schatz A Fast solution method for 2nd order
elliptic operators on piecewise
smooth domains

Carl de Boor / K. Höllig , Approximation order from smooth bivariate
pp functions.

Carlos A. de MOURA A linear, uncoupling algorithm for a nonlinear
model for coupled thermoelastic dynamics

Finite Element Circus 25

Cornell University
May 6-7, 1983

The finite element circus once again returned to the shores of Lake Cayuga for the Spring, 1983 meeting. Besides a full schedule of 17 talks, circus members enjoyed a busy social schedule with lunch at the Statler, an enjoyable cocktail party hosted by Jim and Peggy Bramble, and a fine dinner at L'Auberge.

An example of the growing influence of finite element members in their local communities was provided by Al Seatz's invitation to respond to the following question posed by the Inquiring Photographer of the Ithaca Times (5/83).

Q: what's the hardest part of growing up?
A: Accepting* the experience and advice of older people, especially when you've thought things over and you disagree.

(* Al claims he actually said "Being forced to accept...")

Bruce Kellogg contributed the following poems once again inspired by the beautiful Cornell campus.

High above Cayuga's waters
The circus tent was set.

Fine talks were given by Wheeler, Berger,
The Douglasses, Vogelius, and Schatz

From Sobolev space & $O(h)$

To water dripping down,
The talks & thoughts ranged far and wide
In domains both square and round.

Finite differences got the finger
On slides with many a hue,
We then retired to Peg and Jim's
For a mug of foaming brew.

Attendees

Todd Dupont
Joe Pasciak
Steve Leventhal
Alan E. Berger
A. K. Qaziz
Gene Wackexpress
Steve Serbin
Craig C. Douglas
John Osbon
Richard Taek
Stephen Hilbert
Don Boyce
Chaitan P. Gupta
Al Schet
Larry Boles
Jim Bramble
Donald A. French
Peter Monk
Tony Miller
Michael Butterman
Tom Russell
Ridgway Scott
Dan B. Wahlbin
B. Kellogg
Kenneth Emerson
Michael Vogelius
Dick Ewing
Mary Janett Wheeler
Jim Douglas ✓
J. W.
Oliver A. Mc Bryan

Talks

T. Dupont - 1st order hyperbolic Galerkin
& rough initial data convergence
for nonlinear parabolic Galerkin

J. Pasciak - A preconditioner for the Neumann
Problem on mesh domains

A. Berger - Analysis of a Conservative Finite Difference
method for a Singular Perturbation Problem

C. Douglas - Smoothing and Acceleration and
Multigrid

J. Oston - Approximate solution of differential
equations with rough coefficients

C. Gupta - A family of finite-elements for plane elasticity
problem.

A Schatz: A Fast elliptic solver on irregular
domains using precond. conj. gradient.

L. Bales: On Second Order Hyperbolic
Equations with Time Dependent
Coefficients

T. Russell: On stability of an adaptive implicit
time-stepping method for petroleum
reservoir simulation

R. Scott - Convergence estimates for the discrete ordinates method for the transport equation

L. Wahlbin, The "pollution" effect in L_2 -projections:
Finite Elements, Fourier and Legendre series.

B. Kellogg Oscillatory two point boundary value problem

Mary Fanett Wheeler - Some Numerical Methods
for Reservoir Engineering Problems.
(Block Centered Finite Differences
and a Nine Point Finite Difference
Approximation for Concentration)

J. Sanz-Solé & Plane elasticity with relaxed
symmetry

P. Babuška Geometric postures at an
adaptive approach in FEM

D. Mc BRYAN COMPUTING DISCONTINUOUS FLOWS.

KENNETH ERIKSSON GALERKIN METHODS FOR SINGULAR
BOUNDARY VALUE PROBLEMS IN ONE
SPACE DIMENSION.

FINITE ELEMENT CIRCUS

UNIV. OF TENNESSEE, KNOXVILLE, TN.

OCT. 28-29, 1983.

The Fall meeting of the finite element circus was held at the University of Tennessee in Knoxville. There were twenty six attendees with sixteen talks given. The social schedule included a luncheon on Friday hosted by the Mathematics Dept., an excellent dinner at Alexander's Restaurant, and a party at Steve and Cindy Serbin's home and also hosted by Natalie and Gene Wachspress.

The world's fair had gone from Knoxville
And the town was kind of glam.
There was hope for some new excitement
And a fear it might never come.

Then Steve Serbin had a vision
Of a quasi-optimal event.
And now the symbols of Knoxville are
A sunsphere and a "circus" tent.

ATTENDEES

B. E. Babb
Dick Evans
Rick Fair
Kenne C. Fong
Charles Goldstein
Tom Russell
Michael Vogeli
John Younger Jr.
Chaitan P. Gupta
Felicio Milner
Douglas N. Arnold
John Osborn
Peter Monk
Cliff Costello
Bill Layton
Maria Cristina I. Squeff
Stephen Leventhal
William Symmank
Raj Pal Soni
Ohanes Karakashian
GEORGES H. GUIRGUSS'

Stephen Keeling
Larry Bates
Steve Serbin
Gene Wackpress
Darr B. Wallin

TALKS

Babuška - Some remarks to the γ -version of FEM

Russell - Simulation of miscible displacement using mixed methods and a modified method of characteristics

Douglas - Applications of superconvergence

Doležel - The numerical solution of the reduced wave equation using preconditioned conjugate gradient methods.

Gupta - Global estimates for finite element primal hybrid method for 2nd order elliptic equations.

Arnold - Mixed and nonconforming finite element methods: implementation, post-processing and error estimates

Milner - Interior and superconvergence estimates for mixed methods for second order elliptic problems

Layton - Defect Correction for Singularly Perturbed Convection Diffusion Equns.

Szymczak - Some Remarks on Finite Element Methods applied to 2-D Convection Diffusion Equations

Bales - Cosine Methods for Second Order Hyperbolic Equations with Time Dependent Coefficients

Schatz - Fast solvers for Elliptic Boundary value problems on domains with grids which are combinatorially & topologically "equivalent" to regular grids on unions of rectangles.

A. K. AZIZ - A Petrov-Galerkin method for mixed type equations.

E.L. Wachspress - ADI Preconditioning;
Generalized ADI Model Problems
for variable diffusion coefficients
and 9-pt equations

Lars B. Wahlbin Superconvergence: Hermite Cubics.

R. Falk + P. Munk Logarithmic Convexity for Discrete Harmonic Functions and the Approximation of the Cauchy Problem

n-th Semiannual Finite Element
Conference to Investigate Research Questions

University of Michigan, Ann Arbor

18-19 May 1984

After a hiatus of more than four years, the Circus returned to entertain Ridg Scott and the other folks at Ann Arbor. Ingrid and Claes Johnson hosted, very graciously, a welcoming party on Thursday evening to put everyone in the right mood for the rigors of Friday when Ivo as usual cracked the whip in the morning. Fifteen speakers then proceeded in rapid succession to exhibit their mathematical tumbling in front of an appreciative audience of twentytwo. A break for a massive Afghan-Persian feast occurred Friday evening to counterbalance the rather heavy Swedish accent of this Circus.

The Circus convened in Ann Arbor
to kill off problems we harbor
in West Engineering
our brains were a-searing
as we found di lemmas with ardor.

Those in attendance

Ridgway Scott
Cees Janssen *Bilal*
Jing Douglas *J*
Clay Widmer
Randolph Bank
Craig C. Douglas
Dan B. Wahlbin
Richard Cuieng
Nilotpal Ghosh
Bill Hager
Rick Falk
Jim Bramlee
O. Korakas
Larry Bales
Charan Gupta
Fabio Milner
Maria Cristina J. Squiff
Mohamed KHODJA
Mohammad Asadzadeh
Steve Serbin

Titles of talks presented

Scott - "Perspectives in large-scale scientific computation"

J. Douglas - Iterative methods for mixed method algebraic equations

Bank - An error estimate for the box method for triangular grids

Wahlbin - The smoothing property in nonlinear parabolic systems.

Ghosh - Error-estimates in the Boundary Element Method.

Hager - Solving dual variational problems

Bales - On parabolic equations with time dependent coefficients

GUPTA - Superconvergence estimates for primal hybrid finite element method for second order elliptic problems.

Squeff - An interior penalty method for transport-dominated diffusion problems.

Mohammad Asadzadeh - "A fully discrete analysis of a neutron transport in cylindrical geometry."

Steve Serbin - "Numerical Experiments with a Cosine method for second-order hyperbolic equations with time-dependent coefficients"

Claes Johnson: Error estimates and stepsize control of stiff initial value problems

I Babuska Difficulties with stress computations in the elasticity problem.

J. Bramble - On the construction of preconditioners by substructuring.

C. Douglas - Estimates for Multigrid Rates of Convergence with General Smoothing and Acceleration: the symmetric indefinite case

O. Widlund - "Solving the biharmonic Dirichlet problem using other boundary value problems as preconditioners."

Finite Element Circus

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University of Maryland

9-10 Nov., 1984

The fall meeting of the Circus was held at the University of Maryland on Nov. 9-10. This was a well-attended circus with 37 members attending and 26 giving talks. Only a masterful job of organization by Ivo Babuška and his strict adherence to a tight schedule allowed us to get through all the talks, enjoy lunch at the Chinese Pagoda, dinner at Hogefest restaurant, and attend a performance of Shakespeare's "The Tempest" at the Arena theater.

R. Falk contributed the following poem:

You say you need a fast solver,
But your algorithm is much too slow.
You say you need to move your meshes,
But don't know which way to go.
You say you have a singularity,
But don't understand pollution,
And that the physical quantity of interest
Looks nothing like your approximate solution.
If these are some of your troubles, friend,
There's no need for you to despair.
Just come down to the finite element circus,
And consult the experts there.

ATTENDEES

R. Harc Falk Camille DiAnnunzio
Dinda Hayes William Symysak
Alan Berger Richard C. Morgan
Dug Arnold Paola Pietra
Channes Karakashian Y. Muroya
Vassilios A. Dougalis Dan B. Wahlbin
Charles Goldstein *Milieu*
Leon Greenberg B. Kellogg
Adam Luboborski Jim Bramble
Var Thje Al Schatz
Peter Monk Paul L. Weis
Paul Fredericksen Mitchell Luskin
Craig C. Douglas *P.D.W.*
May Shirley *D. Drury*
Wenzhuang Gu Mel Clement
Soren Jensen *Jens Jorgenson*
Gors *Marilyn*
Chantan P. Gupta *in Q*
Fidelis A. Milner Mary Janet Wheeler
Shagi - D. Shih *Clip Casting*
Dick Ewing Ridgway Scott
John Osborn Abdul K. Aziz
Bengi Lee Larry Bales

Titles of talks

- Palk : Dependence on the elastic coefficients
for a class of anisotropic materials
- L. Hayes: An Overlapping-Block iterative Method.
- Alan Berger A constrained Minimization Problem
Modeling the Orientation Distribution
of Rod-Like Particles
- Doug Arnold: A new mixed formulation for elasticity
- ✓ O. Karakashian: Implicit Runge-Kutta methods for parabolic pbs.
- Craig Douglas: A Multilevel Solver for Linear Equations
- ✓ Mary McClellan: Mixed formulation for elasticity
- ✓ FABIO A. MILNER: A primal hybrid F.E.M. for a quasilinear
second order elliptic problem
- SHAGI-DE SHIH: Asymptotic analysis of a singular perturbation
problem.
- Benqi Guo : the h-p version of Finite element method
- ✓ Dick Morgan: Numerical aspects of homogenization
- ✓ Paola Pietra: Convergence of the approximate
free boundary for a Stefan problem.
- Y. Muraya Remarks on singular perturbation problems.
- Lars B. Wahlbin FEM with anisotropic artificial diffusion
in convection dominated two dimensional problem.
- ✓ Larry Bales Single Step Finite Element Approximations
for Nonlinear Second Order Hyperbolic
Equations

✓ Chip Eastham Some Modifications of a Parallel Algorithm for Solving Systems from Galerkin Methods

Mitchell Lustkin Numerical Methods for the mechanics of magnetic recording.

✓ Ricardo Durán : Estimates for piecewise linear approximation for Dirichlet problem using Orlicz norms.

Jim Douglas Jr New mixed finite elements

Václav MAJER A FACTORIZATION BASED SOLVER FOR TPBVP'S FOR ODE'S

Manil Suri Mixed vs Standard Methods.

Søren Jensen Dimensional reduction for some nonlinear problems.

Wenzhuang Gui Behavior of h, p, h-p extensions of the finite element method in 1-dim case.

Ridgway Scott Effects of quadrature errors in boundary element methods (joint work with Claes Johnson)

Jim Bramble A uniformly well conditioned iterative method for solving the Stokes equation and related problems.