

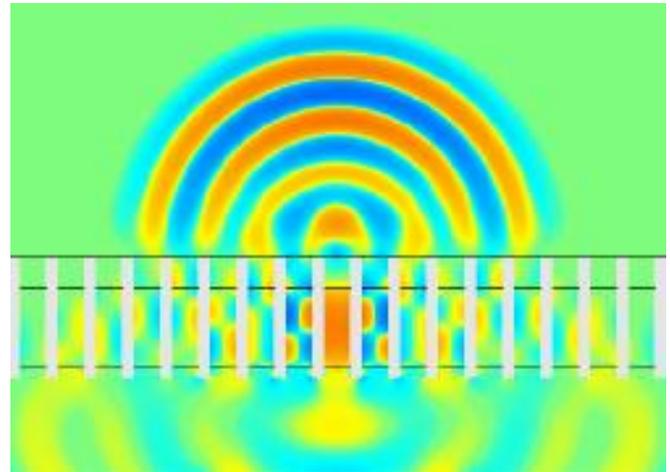


PZFLEX

THE FINITE ELEMENT SOLVER FOR PIEZOELECTRIC
MODELING

Transducer Modeling

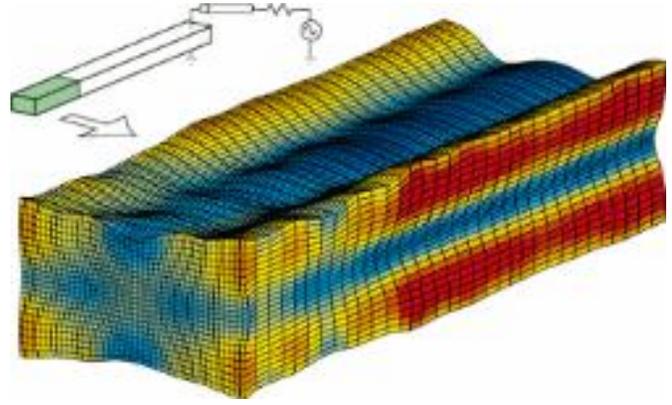
- 2D and 3D electromechanical models with electrical circuits
- Time-domain continuum and structural finite elements
- Complete radiation boundary conditions
- Material absorption in solids and fluids



Medical ultrasound 1D array transducer

Vibration & Parameter Studies

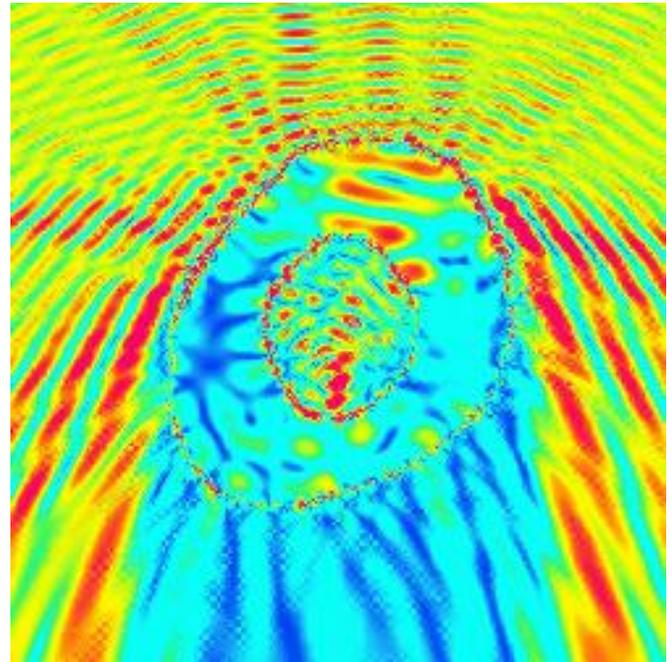
- Impedance plots from FFT of transient response
- Wave field extrapolation
- Material parameter variation studies
- Time-domain analysis of steady-state response and fields



*Piezoelectric ceramic bar
and impedance analyzer circuit*

Ultrasound Modeling

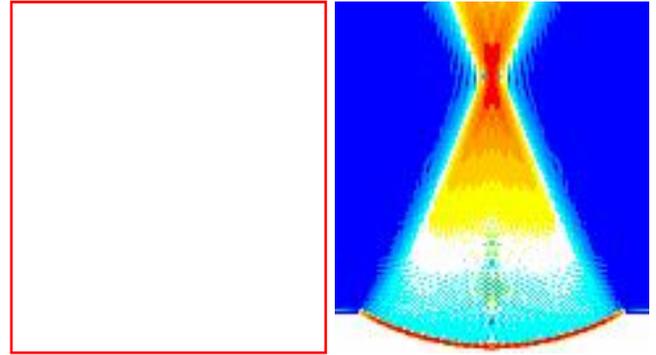
- Ultrasound interaction with soft and hard tissue
- Arbitrary 2D/3D models from scans
- Elastic and acoustic materials with absorption and nonlinearity



*CW propagating across
a tissue-femur-marrow section*

Wave Propagation Studies

- Focused beams from baffled actuators or transducers
- Analytical wave field extrapolation
- Transient or steady-state wave phenomena



*Pressure field from a curved transducer
phased vs. uniform drive*

Visualization Tools

- Color plots of models, mechanical & electrical fields
- Line (x-y) plots
- Grayscale or color Postscript
- On-screen movies

Workstation Platforms:

- IBM (AIX), SUN (Solaris), HP (HPUX), SGI (IRIX) and PC (Windows 95/NT or Solaris x86).

Each License provides:

- Executable version of the code
- User's manual
- Training and Telephone Support
- Example models with parametrizations

Further services include:

- Consulting and problem analysis
- On-site training
- Adaptation to installed hardware
- Customization
- Upgrades

Enhancements (September 96 release):

- Round-trip insertion loss
- Farfield extrapolation based on time-domain integral equation
- Beam patterns
- Added functionality for "receive" problems
- More damping models
- Easier computation of steady-state deformed shape and other frequency-domain results

For more information about PZFlex, visit the [PZFlex Index](#) and contact:

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