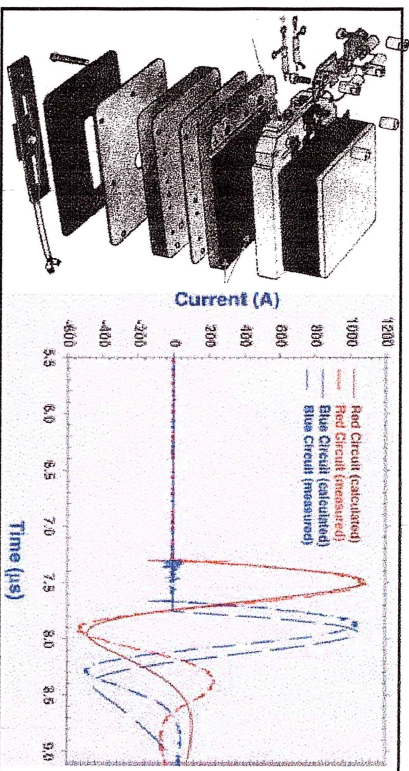


Modeling the MCC3028 Firing Set and Simulating Its Performance

PB2T

BaMoO₄ and PZT



Goal

- Create a comprehensive, coupled 3-D electromechanical (EM), age aware model of the MCC3028 slim-loop ferroelectric (SFE) firing set

Approach

- Use EMMA, a 3-D Lagrangian-Eulerian computer code which includes electromagnetic field calculations and attached circuits
- Create computational model
- Simulate performance

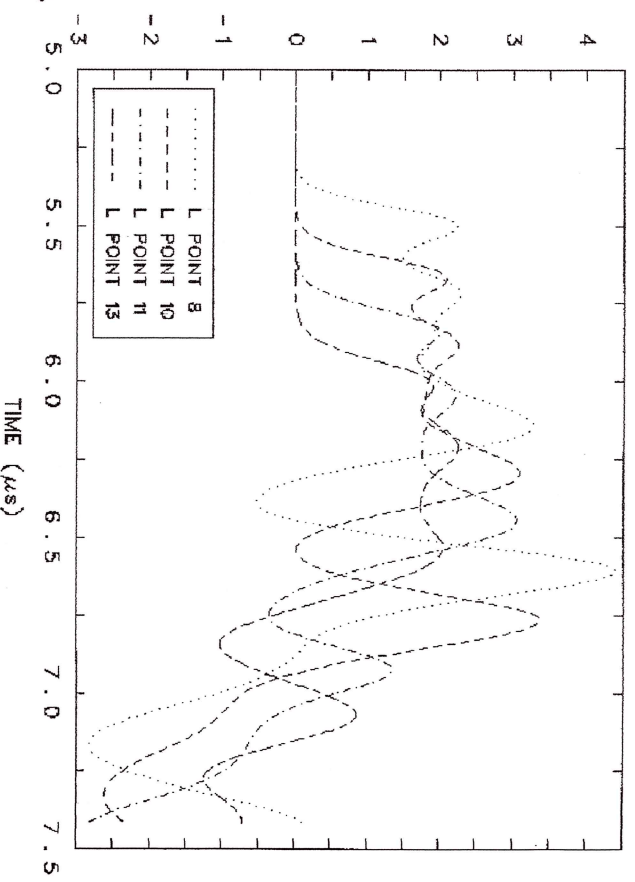
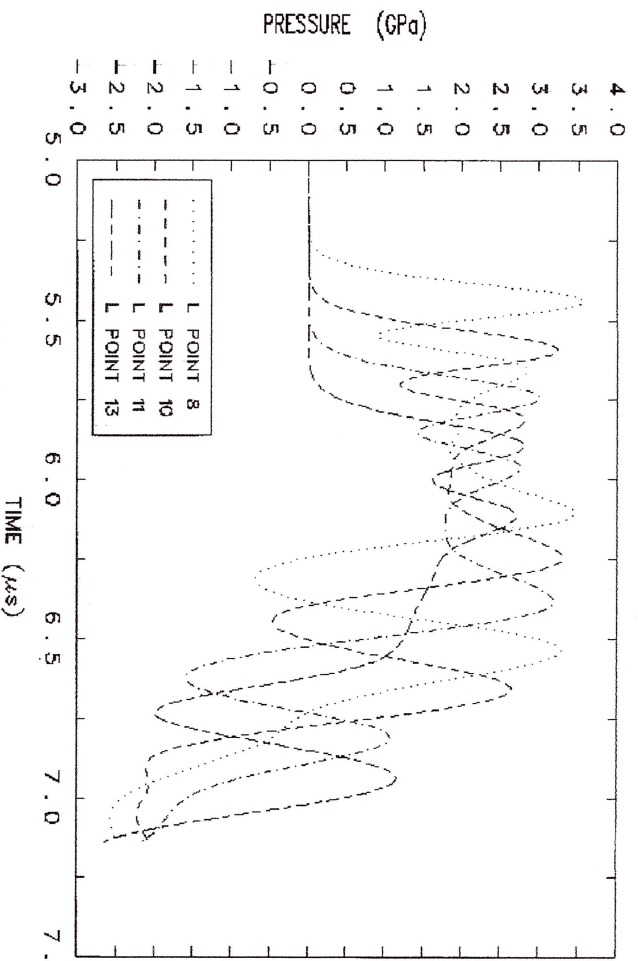
Customer/User

- **George Clark**

Accomplishments

- Met all customer expectations by end of FY00 including documentation
- Obtained new SFE data (Pandora's Box)
 - PBZT conductive at high pressures, fields
- Added mylar layer and interfaces between SFE elements to calculate correct pressures in SFE stack (full-stack and quarter-cell models)
 - Possible because of Cubit development and teaming
- Developed new EM model for SFE material
 - Includes strain and electric field dependence
- Obtained new data for validation process
 - Preliminary comparisons look good

Comparison of Pressures in SFE Stack



These results show effects on pressure of including a 3-mil mylar layer between buffer plate and SFE stack and RTV-foil interfaces.

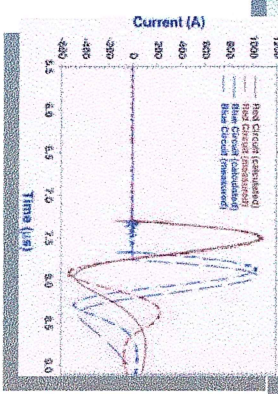
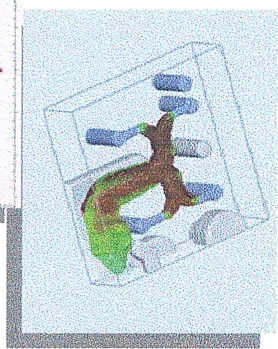
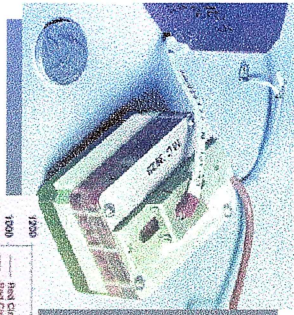
We apply ...

Sandie 12/1/01
Dept review
~~Patent~~

Computational Physics

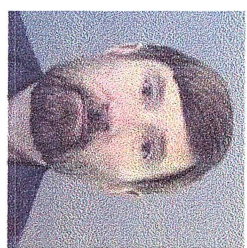
Simulation Frameworks

30/5/01

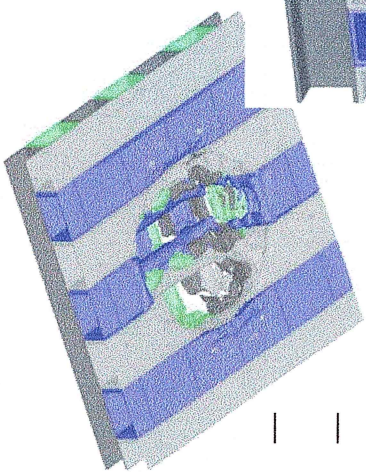
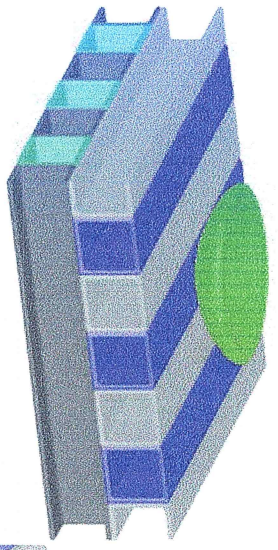


Firing Set

- electromech. model
- model explosives, pzt
- aged materials



Paul



Access Denial

- terrorist attack
- delay access
- impact design

Marlin



Jason

