How C3D kernel helped QuickField to become a powerful 3D electric analysis tool

Alexander Lyubimtsev
Support Engineer
Tera Analysis Ltd.

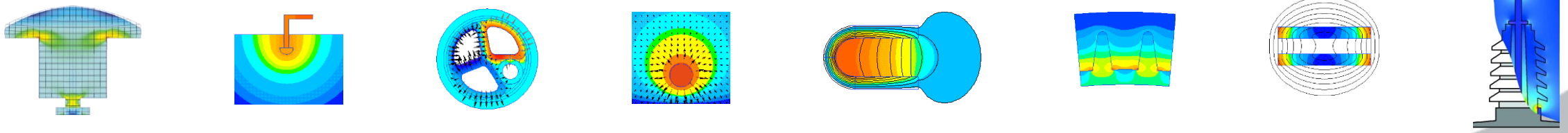
QuickField analysis options

Magnetic analysis suite	Magnetostatics
	AC Magnetics
	Transient Magnetic
Electric analysis suite	Electrostatics (2D,3D) and DC Conduction (2D,3D)
	AC Conduction
	Transient Electric field
Thermostructural analysis suite	Steady-State Heat transfer (2D,3D)
	Transient Heat transfer
	Stress analysis

https://quickfield.com/pack.htm

QuickField applications

- Actuators
- Building insulation
- Cables
- Capacitors
- Electrical machines
- Electron-ion optics
- EMC analysis
- High voltage systems
- Induction heating systems
- Insulators
- Magnetic systems
- Mechanical devices
- PCB design
- Sensors
- Speakers
- Superconductors
- Thermal models
- Transformers
- Transmission lines



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QuickField customers

Universities

- Technical University of Liberec
- Aalborg University
- Hannover University
- Dublin City University
- University of Tel-Aviv
- University of Palermo
- Eindhoven University of Technology
- Cornwall College
- Massachusetts Institute of Technology
- Princeton University
- Stanford University
- University Of Illinois
- University of Missouri
- University of Pennsylvania

Research centers

- Department. of National Defense (Canada)
- Institute of Physics Academy of Sciences of the Czech Republic
- Nokia Research Center
- CEA/SACLAY
- Max-Planck-Inst. f. Plasmaphysik
- Korea Atomic Energy Research Institute
- TNO Institute
- Euratom Ciemat para fusion (Spain)
- Cern
- Naval Research Laboratory
- Jet Propulsion Laboratory
- Lawrence Berkeley National Laboratory
- Los Alamos National Laboratory

Industrial companies

- NOKIA
- Siemens AG
- Schneider Electric
- Hitachi Inc.
- Ericsson Cables AB
- Lotus Engineering
- American Superconductor
- Baldor Electric Company
- Boeing
- Cymer
- General Electric Company
- General Motors
- Hewlett-Packard Corp.
- IBM
- Iomega Corp.
- Lockheed Martin
- Motorola

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- Lockheed Martin
- Motorola

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Our customers at Naval Research laboratory

Follow This Author

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Also published under: R. Allen, Raymond J. Allen, Raymond Allen, Ray Allen

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Publication Topics

anodes, cathodes, electron emission, electrochemical electrodes, X-ray apparatus, X-ray emission spectra, X-ray tubes, cameras, current density, electric

Show More

Biography

Raymond J. Allen (M'91–SM'13) received the B.S., M.S., and Ph.D. degrees from Old Dominion University, Norfolk, VA, USA, in 1992, 1994, and 1998, all in electrical engineering.,He has been with the Naval Research Laboratory (NRL), Washington, DC, USA, with a focus on pulsed power systems since 2000. He is currently a Senior Engineer with the Pulsed Power Physics Branch, Plasma Physics Division, NRL. *(Based on document published on 15 September 2015).*

Publications	Citations
84	261

Publications by Year

1992 2019

Co-Authors:

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V. Bailey
F. Bayol

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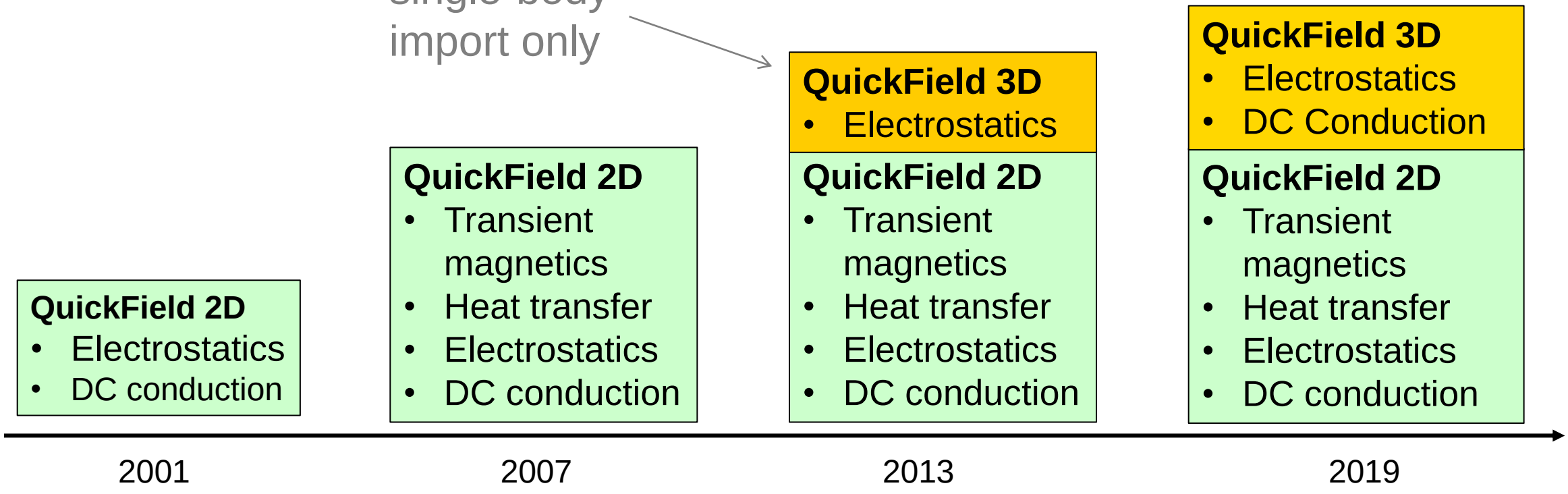
QuickField in Naval Research Laboratory

QuickField 6.0
free 3D library:
single-body
import only

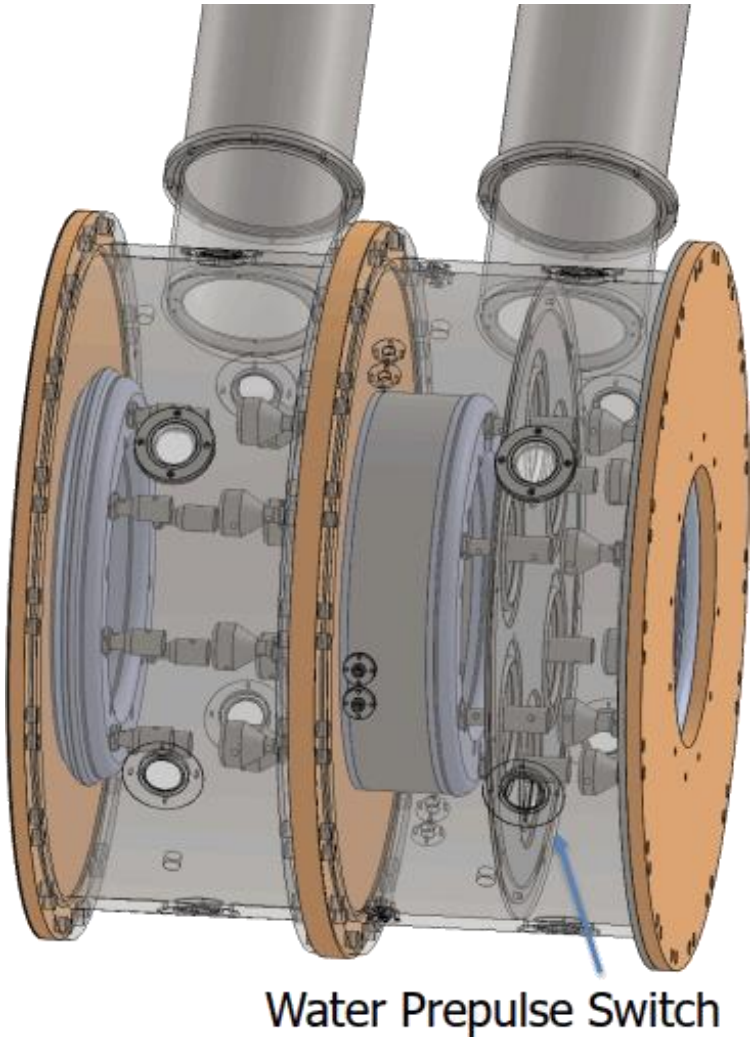
QuickField 6.4
C3D Kernel:
multibody assembly import



Naval Research Laboratory is in our customer list from 2001. https://www.nrl.navy.mil

Use case: QuickField 3D analysis of Gamble high voltage switch

Prepulse switch



Switch consists of two groups of electrodes (grounded and high-voltage) separated by a shielding disk, enclosed in the metal body.

Problem specification:

Relative permittivity of water $\varepsilon_r = 81$,
Applied voltage $V = 4$ MV.

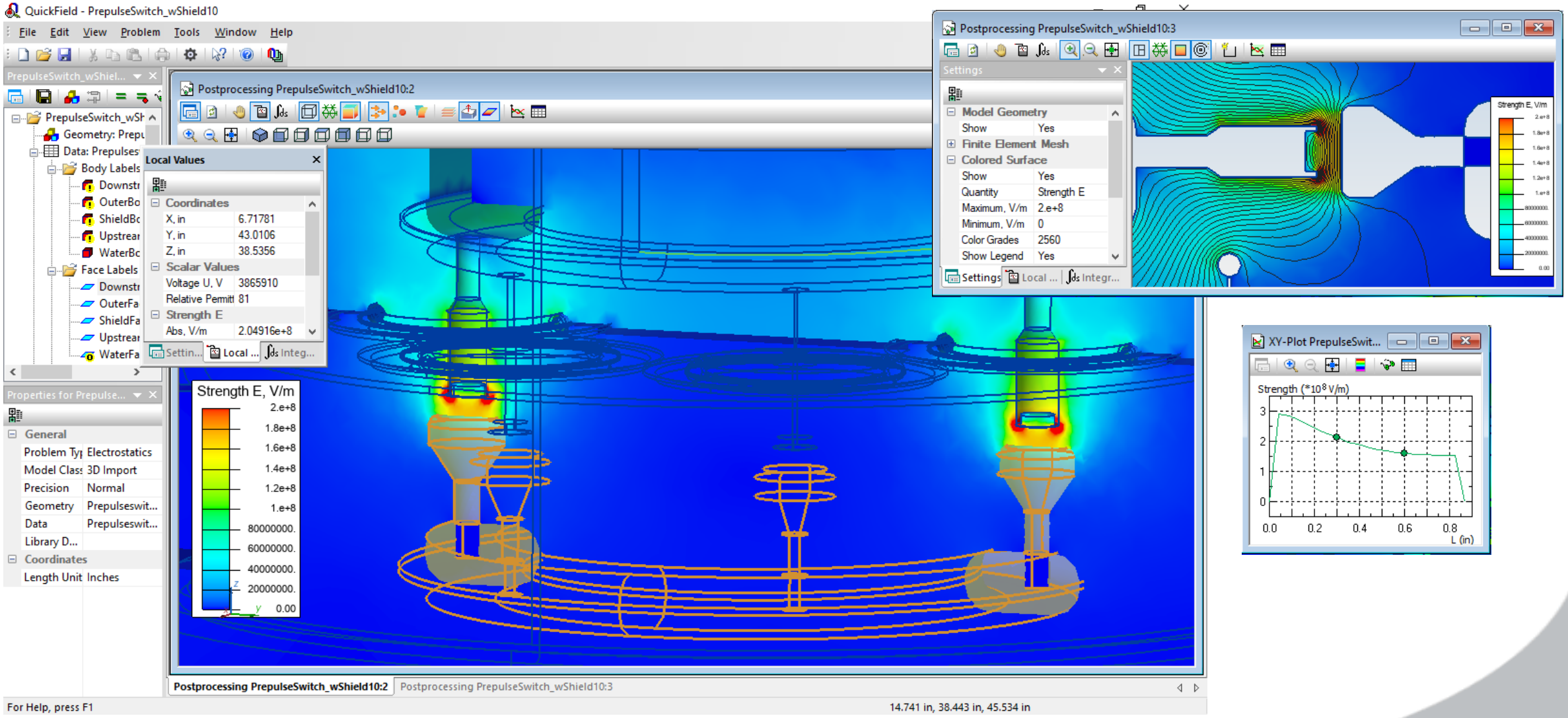
Task:

Calculate the electric field distribution in the device. Find the charge on electrodes.

Image courtesy of Plasma Physics Division, Naval Research Laboratory

https://quickfield.com/advanced/prepulse_switch.htm

Prepulse switch electric field stress



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