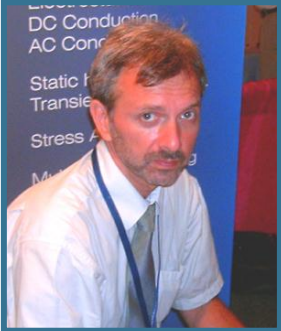# QuickField 6.0

Vladimir Podnos,
Director of Marketing and Support,
Tera Analysis Ltd.
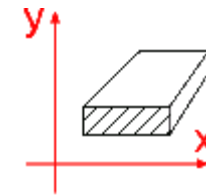

Alexander Lyubimtsev,
Support Engineer, Tera Analysis Ltd.
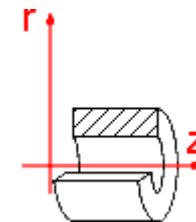

Sergey Ionin
Support engineer, Tera Analysis Ltd.

QuickField: before 6.0

Magnetic analysis suite	
Magnetic Problems	2D Magnetostatics
	2D AC Magnetics
	2D Transient Magnetics
Electric analysis suite	
Electric Problems	2D Electrostatics and 2D DC Conduction
	2D AC Conduction
	Transient 2D Electric field
Thermostructural analysis suite	
Thermal and mechanical problems	Steady-State 2D Heat transfer
	Transient 2D Heat transfer
	2D Stress analysis

plane-parallel

axisymmetric

QuickField 6.0

| Magnetic analysis suite	
Magnetic Problems	2D Magnetostatics
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Thermostructural analysis suite	
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	Transient 2D Heat transfer
	2D Stress analysis

+

Voltage U

3D Extruded Electrostatics

QuickField 6.0

Magnetic analysis suite	
Magnetic Problems	2D Magnetostatics
	2D AC Magnetics
	2D Transient Magnetics
Electric analysis suite	
Electric Problems	2D Electrostatics and 2D DC Conduction
	3D Electrostatics
	2D AC Conduction
	Transient 2D Electric field
Thermostructural analysis suite	
Thermal and mechanical problems	Steady-State 2D Heat transfer
	Transient 2D Heat transfer
	2D Stress analysis
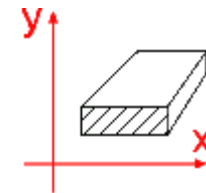
plane-parallel
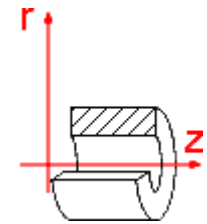
axisymmetric
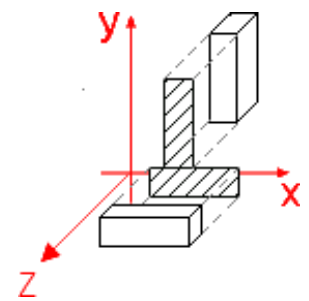
3D extrusion

New type of analysis: 3D Extruded Electrostatics

- Constant isotropic electric permittivity varying by bodies

- Field sources include electric charge or charge density defined in any type of geometric entities: bodies, faces, edges, or vertices

- Dirichlet or Neumann boundary conditions can be applied to any of faces, edges, or vertices
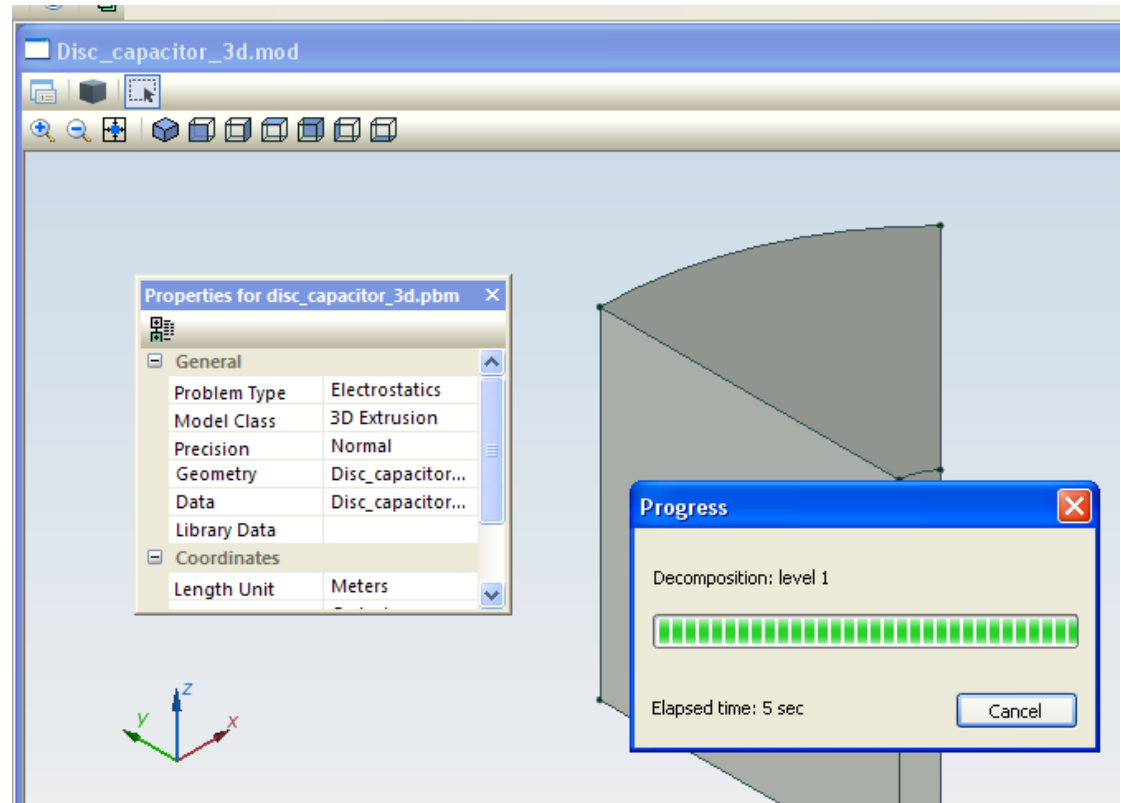
3D Preprocessing

- Automatic conversion of any existent 2D plane-parallel electrostatic model into corresponding 3D model (all planar objects will be attributed by the model depth set ting of the 2D problem)
- 3D geometric model creation by a fixed-depth cross-sectional multilayer extrusion of a 2D model
- 3D View mode in the Postprocessor
- Automatic 3D mesh generation controlled by mesh spacing values defined on a set of vertices
- Properties and boundary conditions set by assigning labels to any geometric entity
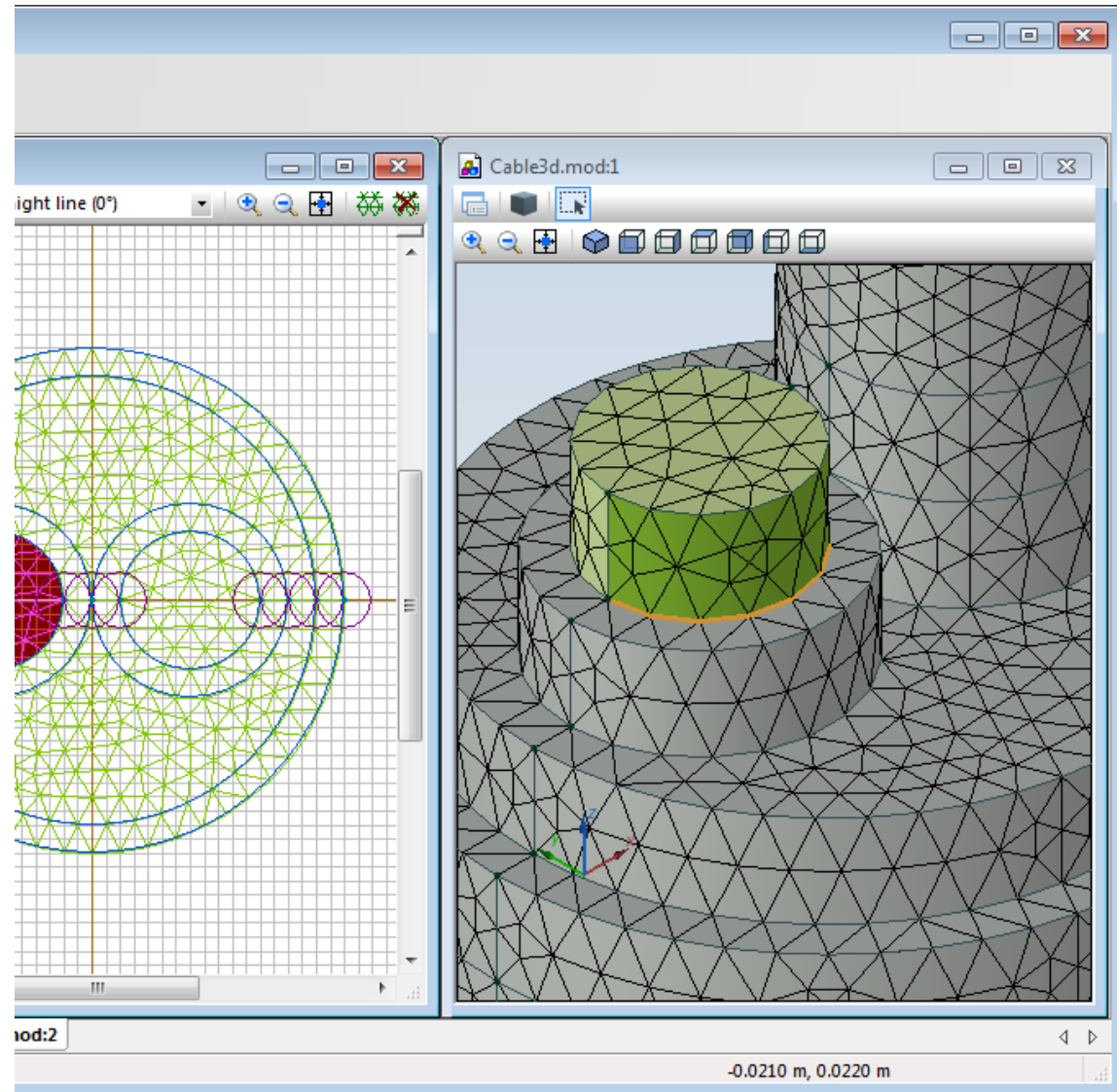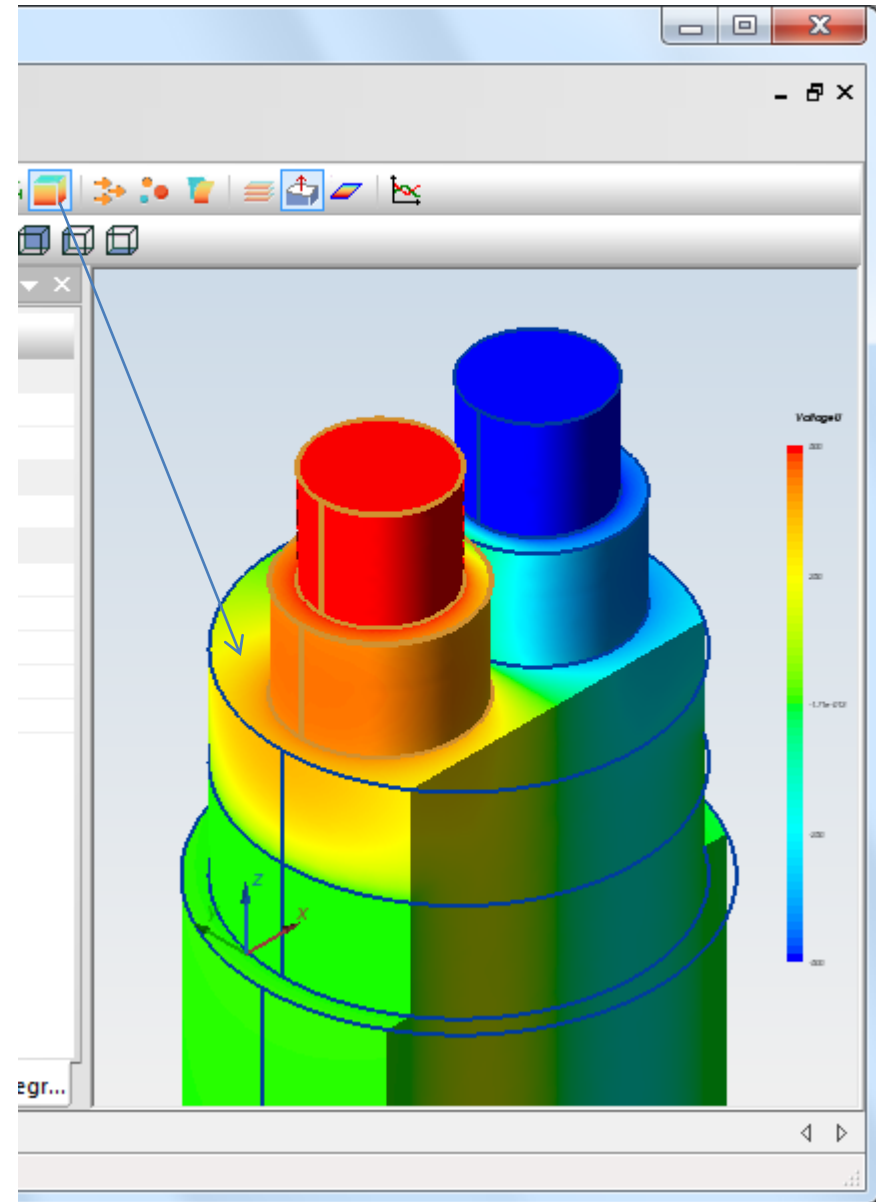
3D Solver

- Geometric Domain Decomposition in 3D with parallelization
- Millions of degrees of freedom in less than a minute on a moderate PC

3D Postprocessing

- **Color maps of selected physical quantities in full 3D view, on the arbitrary cross section or on the slices**
- Local value display with robust picking capability
- X-Y plots along the chosen edges
- Vector plots in 3D view
- Isolines on an arbitrary cross section
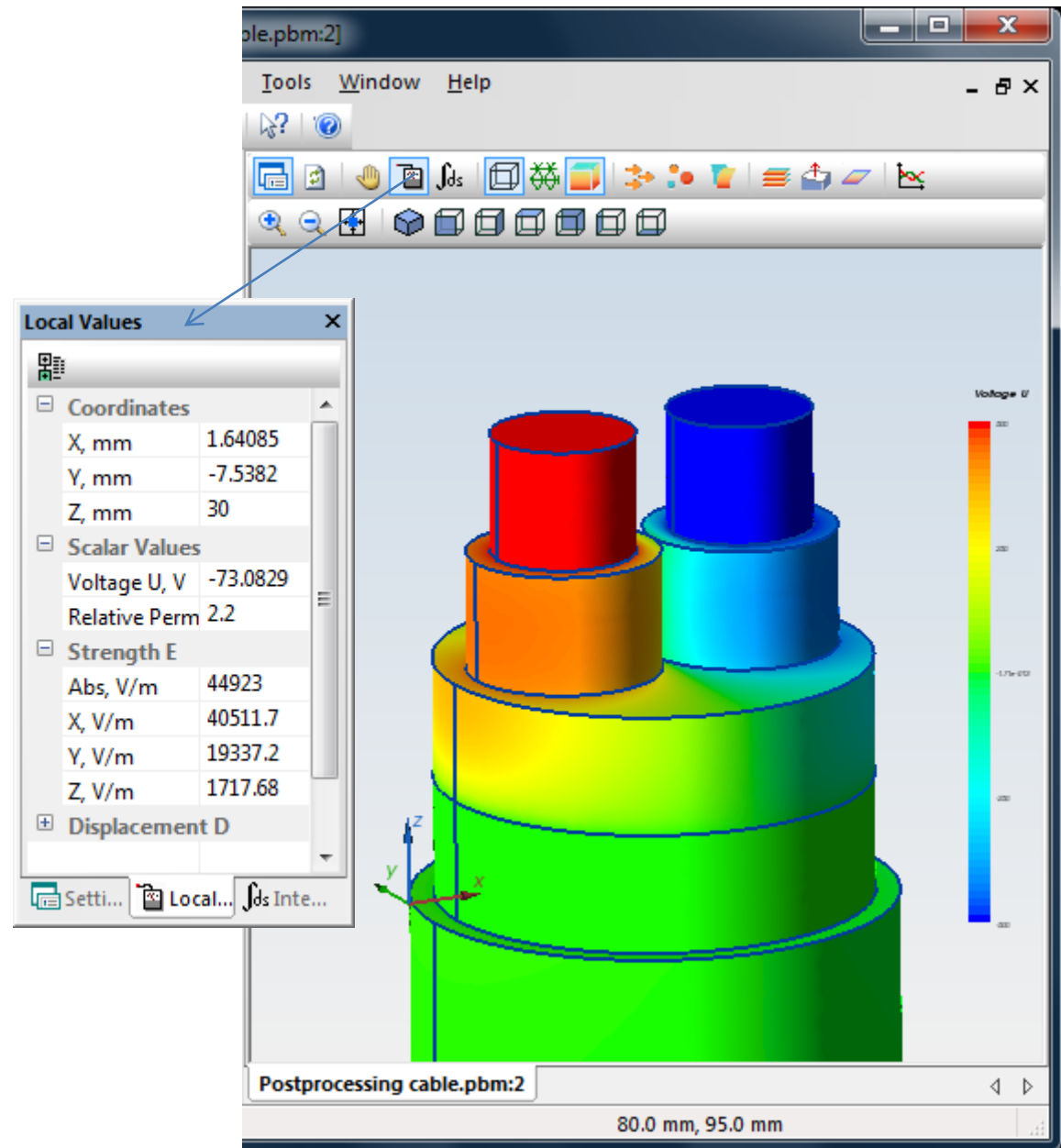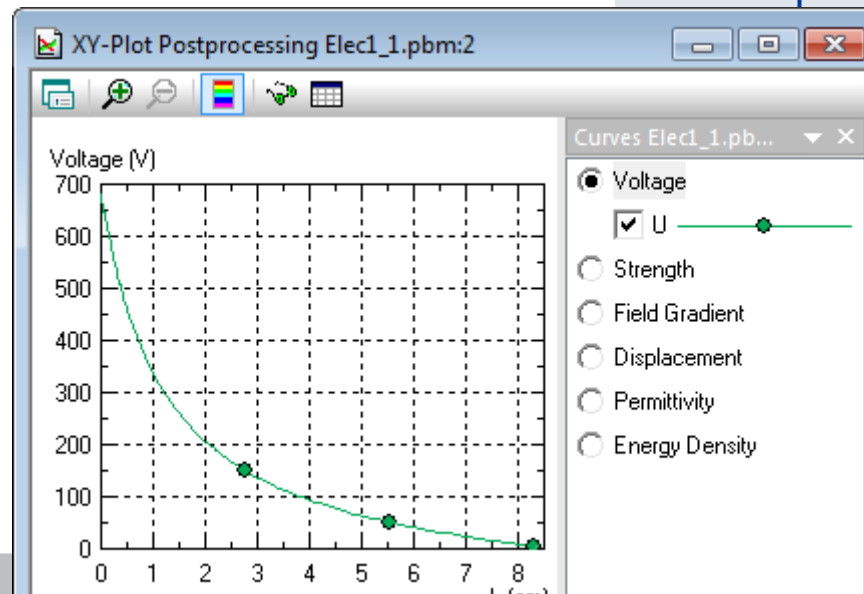- Integral quantities over the volumes
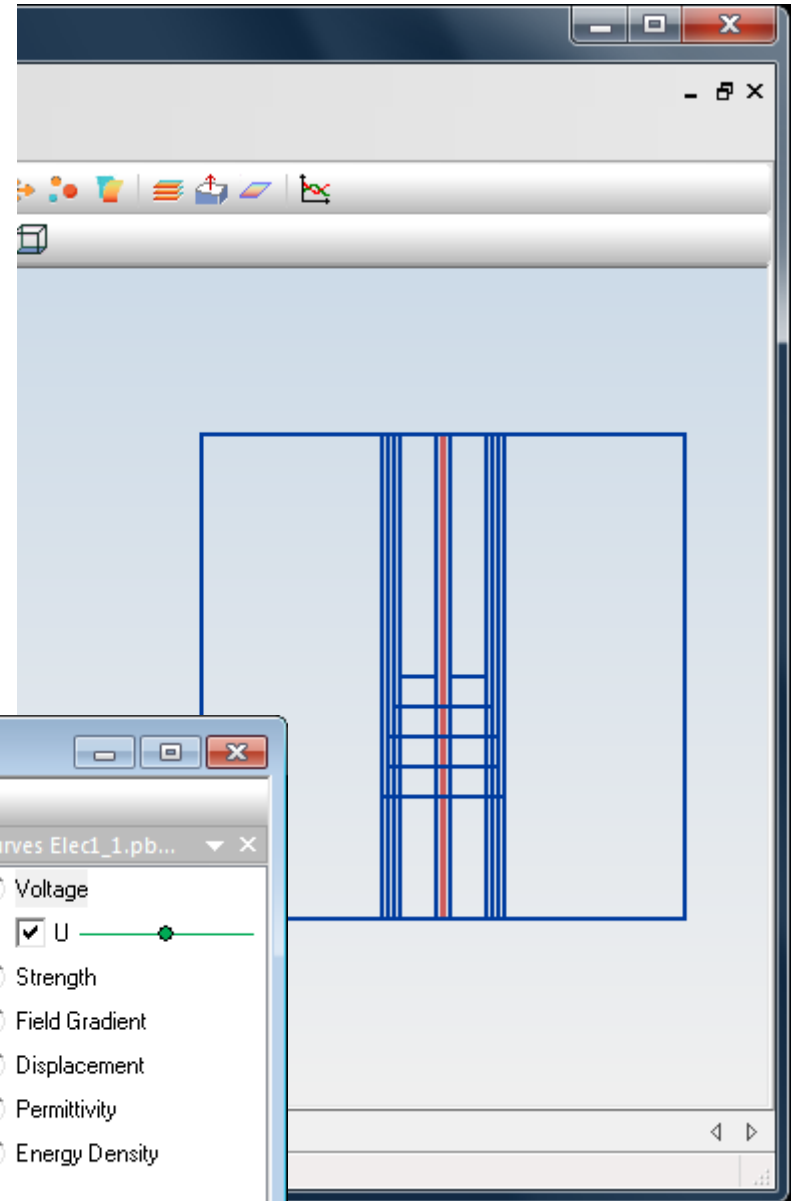
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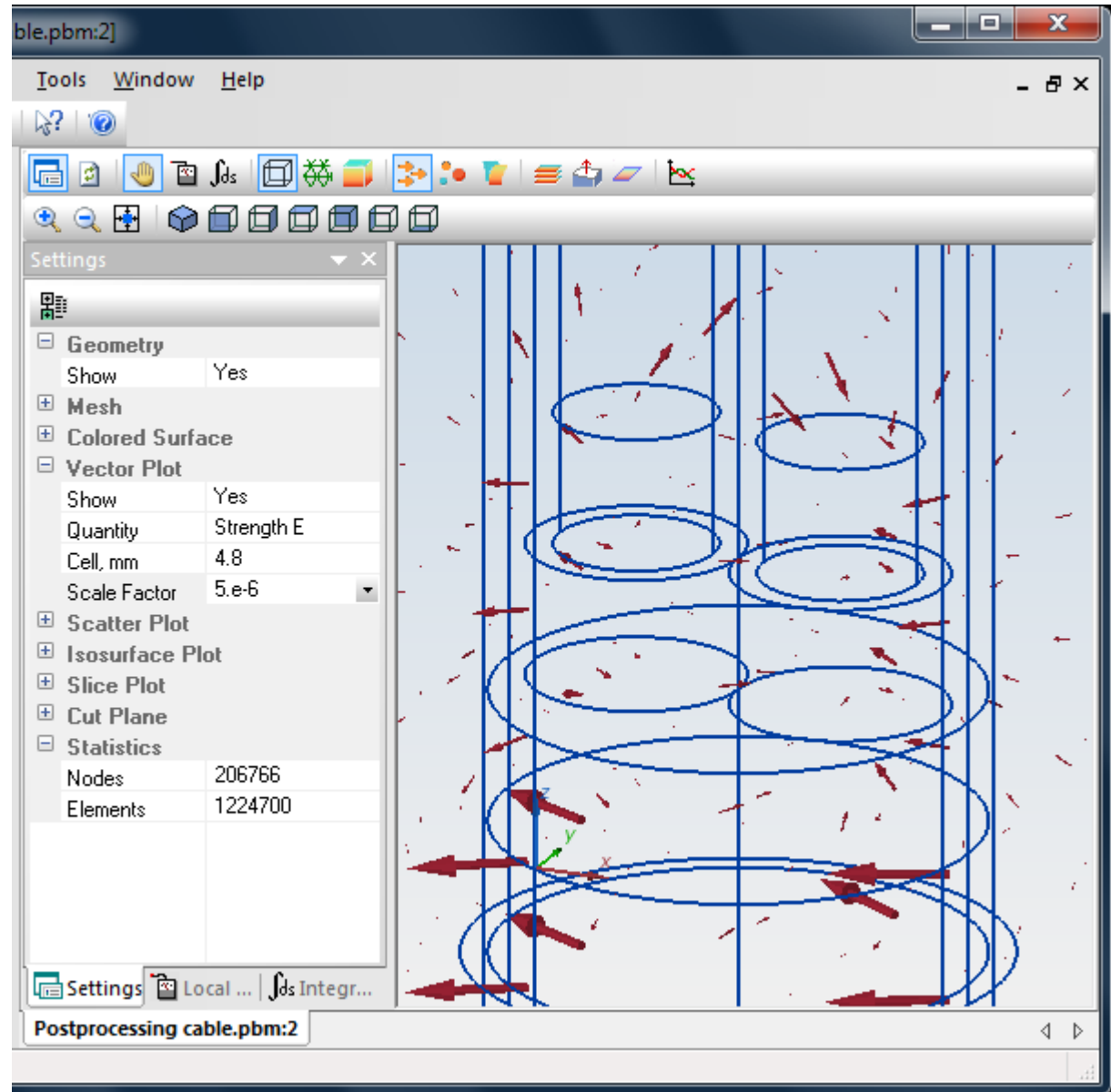
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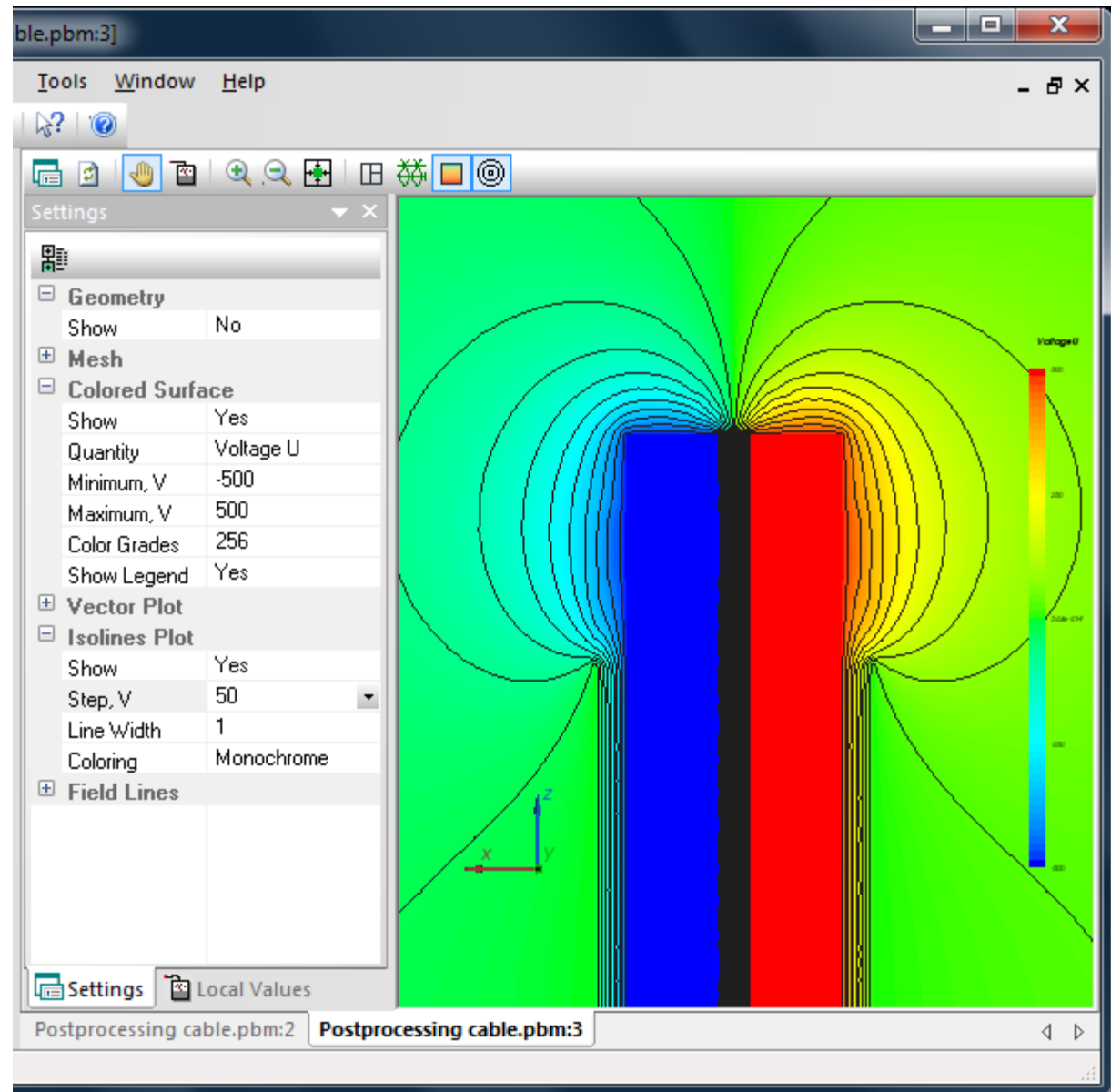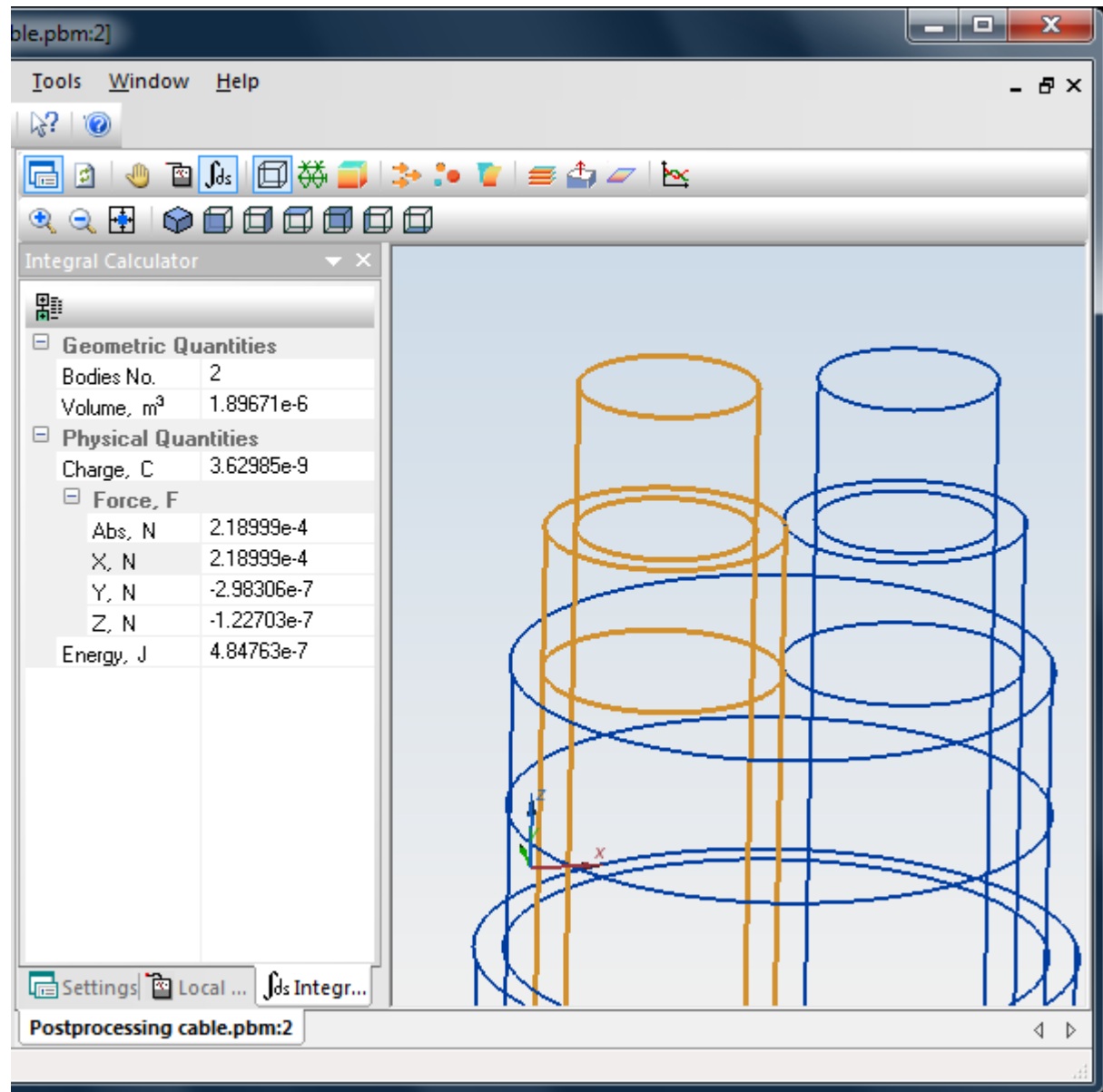
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3D Postprocessing

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- **Integral quantities over the volumes**

QuickField 6.0 Editions

	QuickField Student Edition	*QuickField Lite Edition*	*QuickField Professional Edition*
Mesh size limit	255 planar nodes	about 4000 planar nodes	No artificial restrictions
Cost	**F R E E**	Calculate quotation online QuickField.com>Product>Order	
License term	permanent	per year	per year or permanent
Network licensing availability	single-user only	License permits **unlimited** number of concurrent QuickField sessions within a campus	Single-user and agreed number of floating network licenses are available
Licensing requirements	no restrictions	Academic only	No restrictions, however, commercial and academic licensing terms are different

QuickField 6.0 pricing:

No major changes planned.

Additional functionality does not bring additional costs for customers. Maintenance and update policies will remain intact.
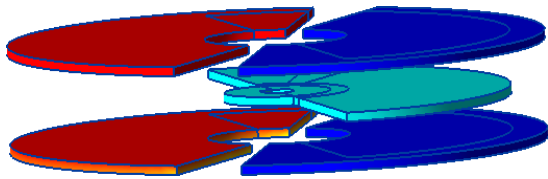
QuickField 6.0 pricing:

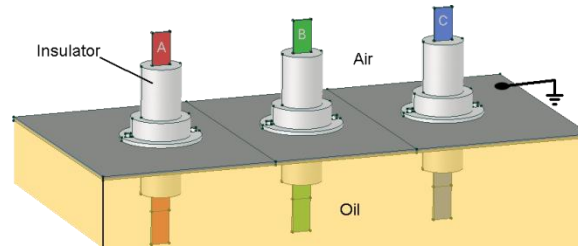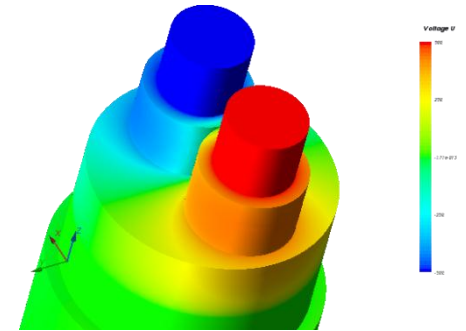All active QuickField users with valid maintenance will get 6.0 for free.
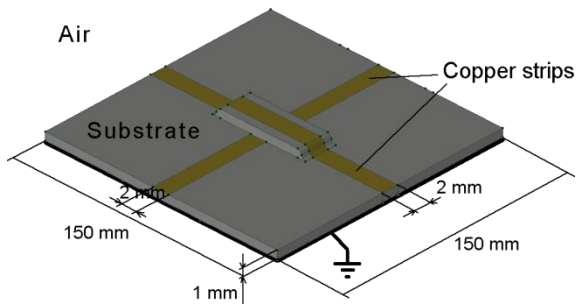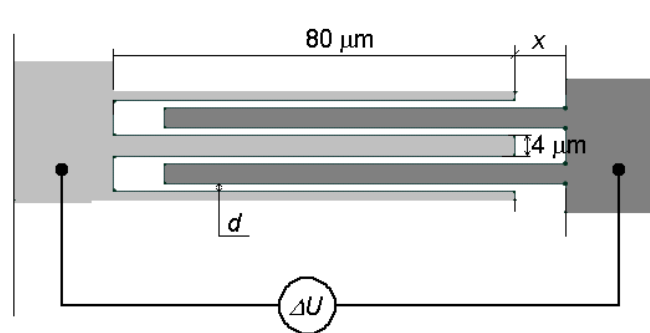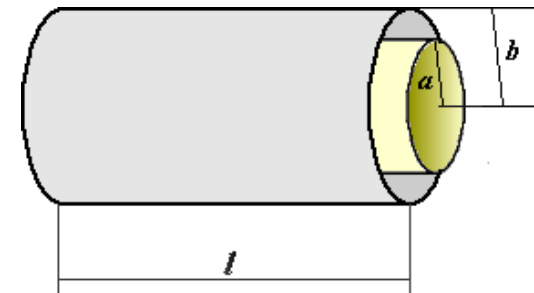
3D examples

Variable capacitor

Insulator
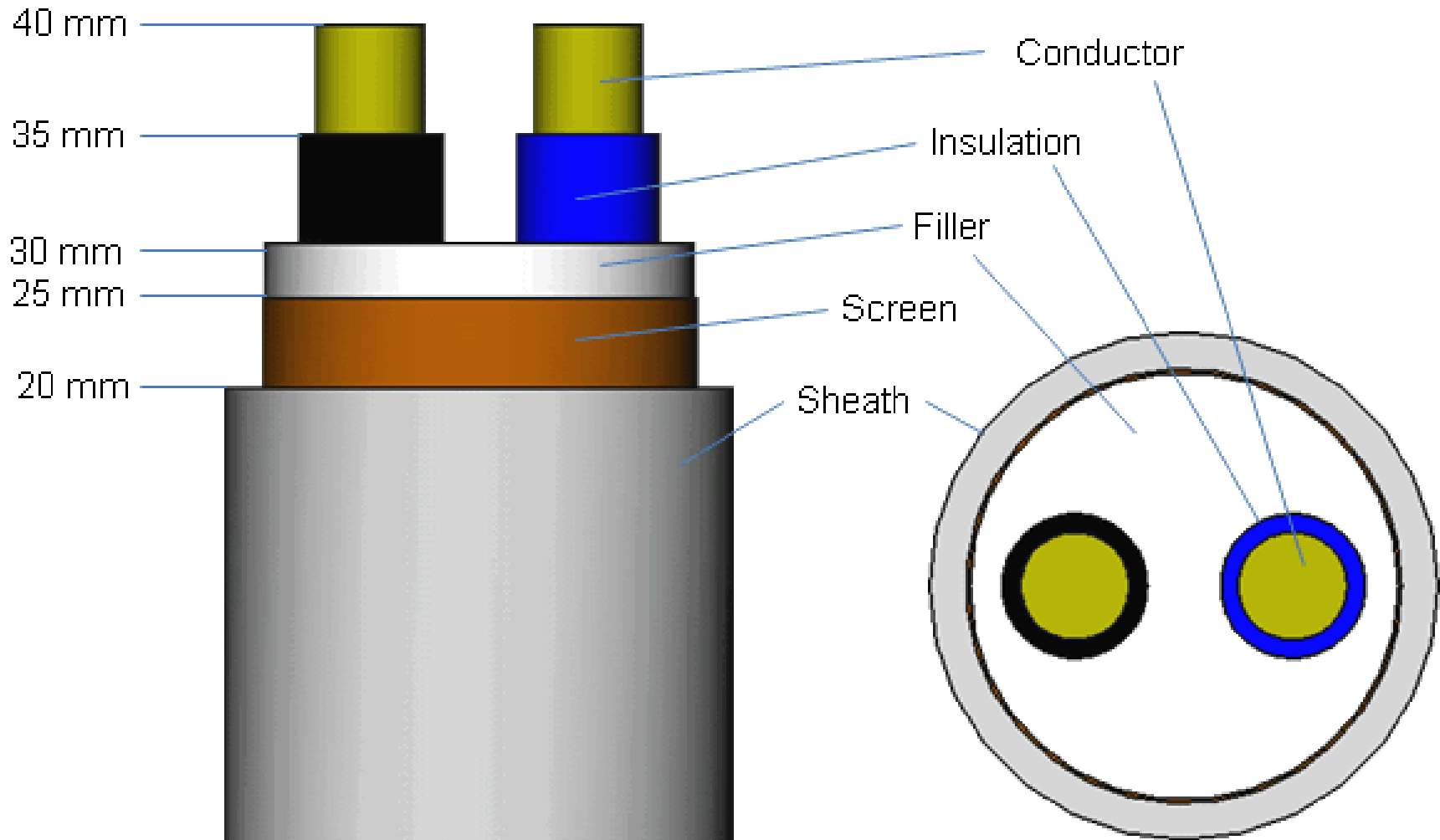

Cable termination

Crossover

Comb drive

Cylindrical capacitor

Cable termination

40 mm

35 mm

30 mm
25 mm

20 mm

Conductor

Insulation

Filler

Screen

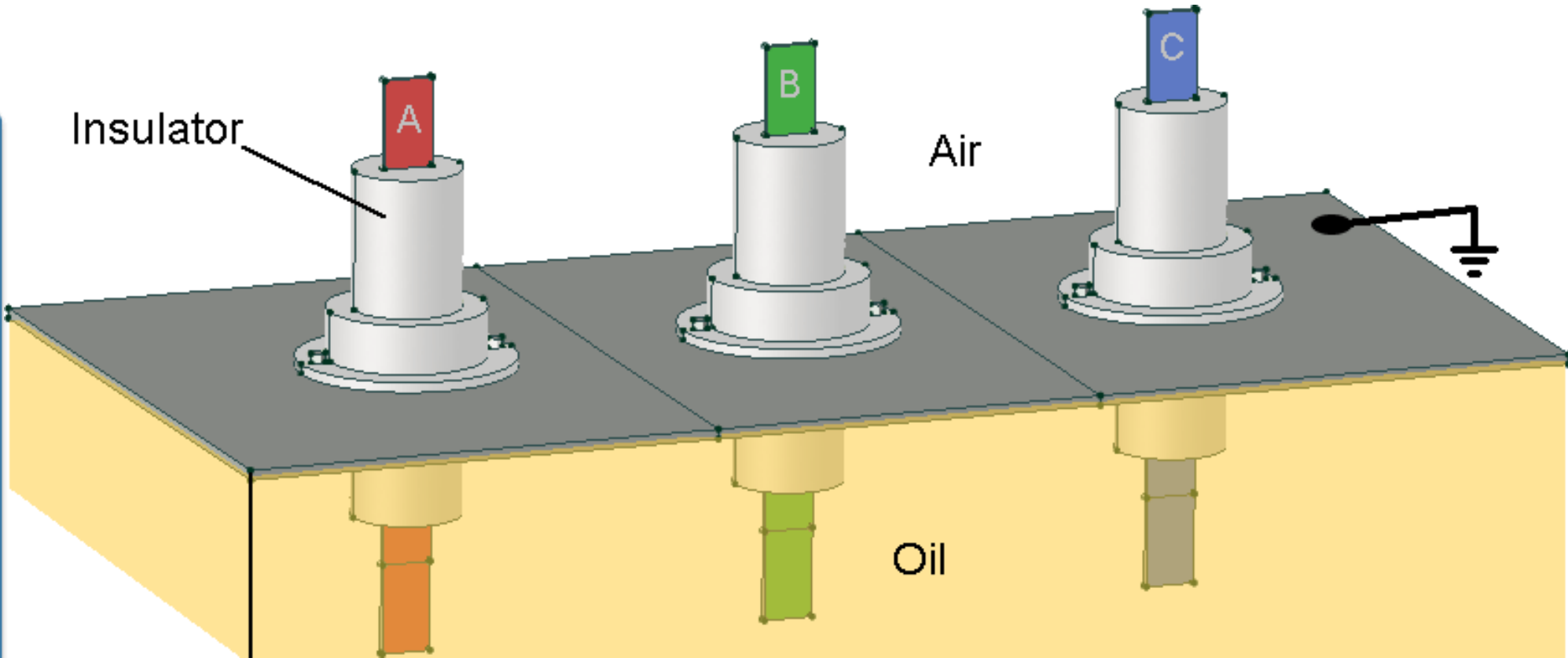Sheath

Task: find electric stress distribution.
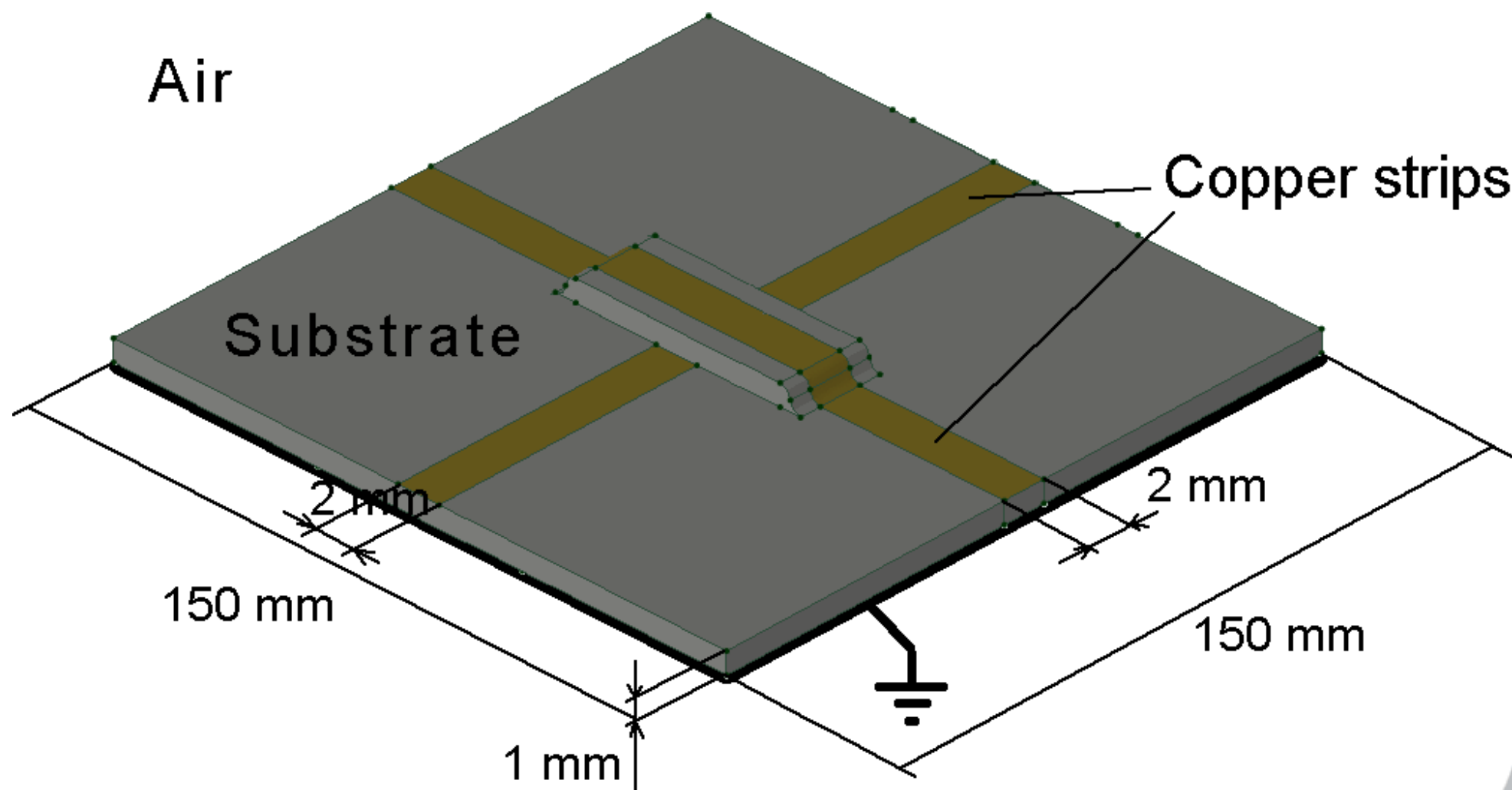
Insulator

Task: find electric stress distribution.
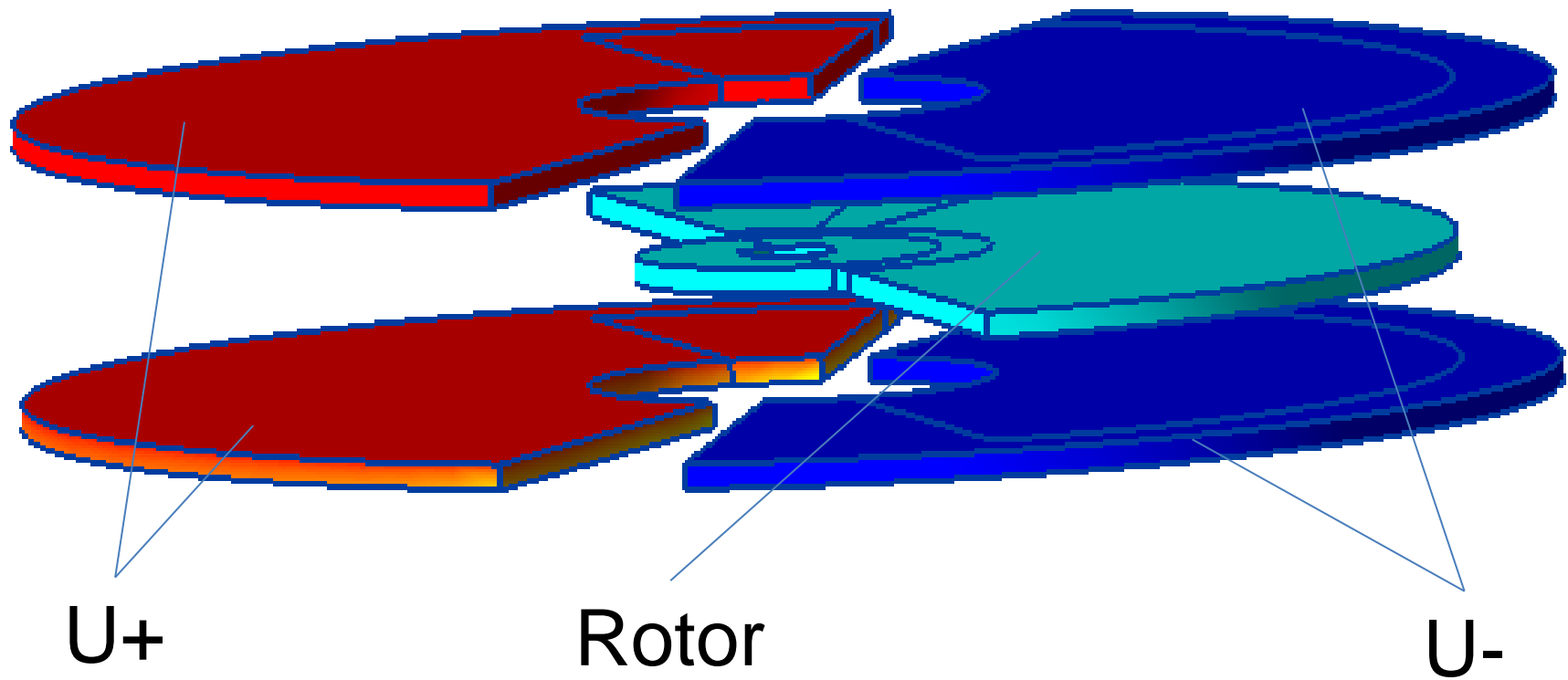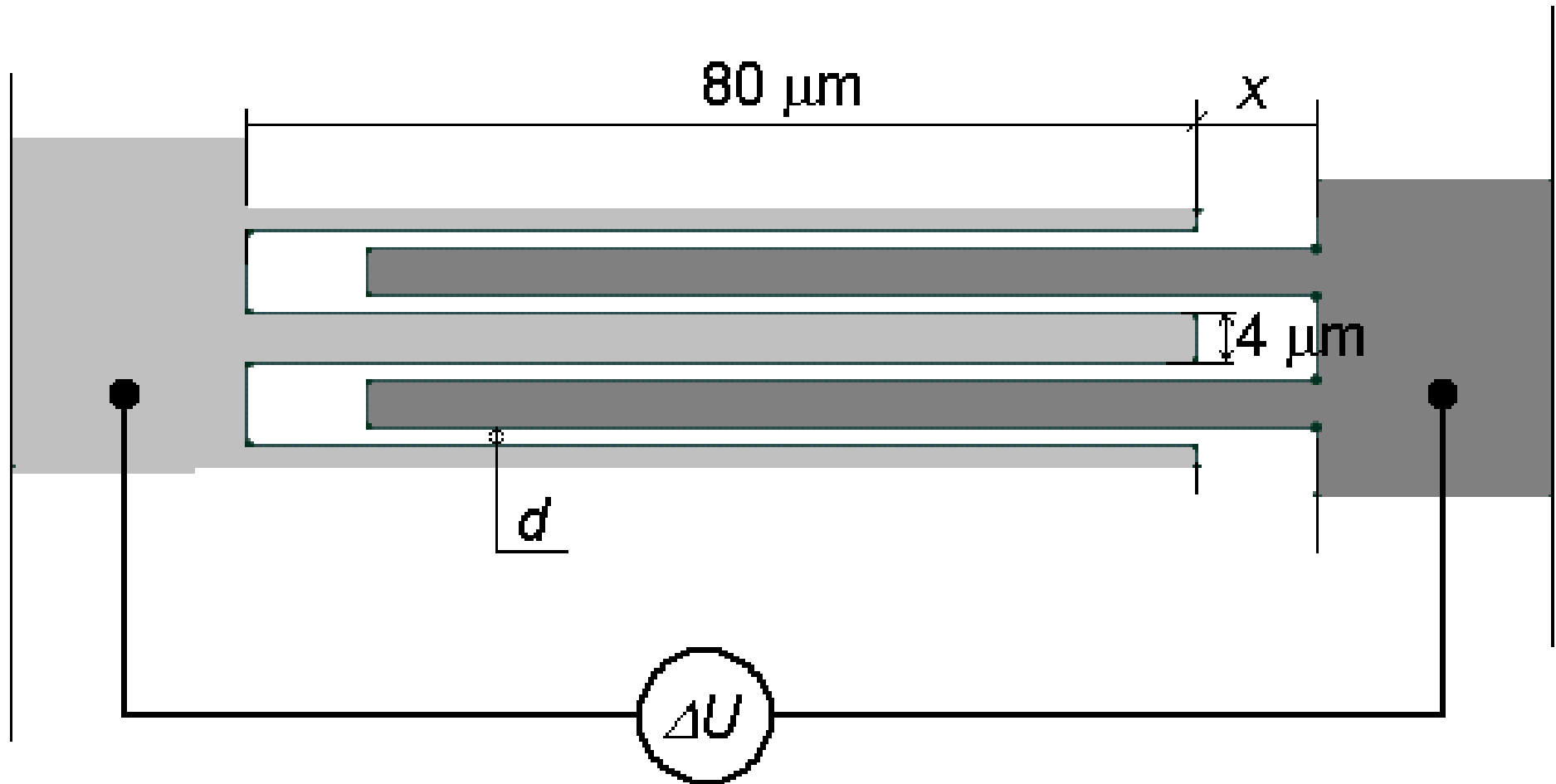
Crossover

Task: find mutual capacitance.

Variable capacitor

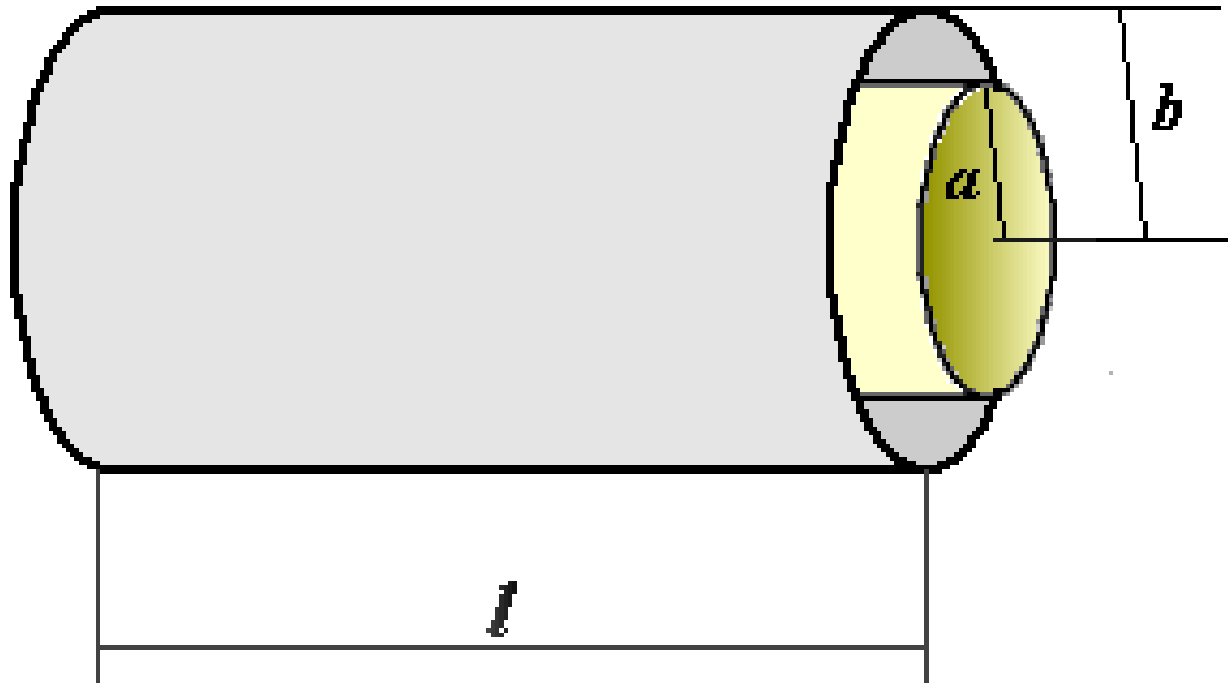U+   Rotor   U-

Task: find mutual capacitance.

Comb drive

Task: find force

Cylindrical capacitor

$a = 5$ mm, $b = 6$ mm, $l = 40$ mm

Capacitance: $C = 2\pi\varepsilon\varepsilon_0 * l / \ln(b/a) = 2{,}44e\text{-}11$ [F]

Future 3D developments

3D electrostatics:

- 3D geometry import from popular CAD systems (including freeware products)
- Better control of the mesh density in the 3-d dimension
- Acceleration of 3D solvers

Bringing more types of analysis to 3D (Thermal, Magnetic, Time-Harmonic, Transients...)