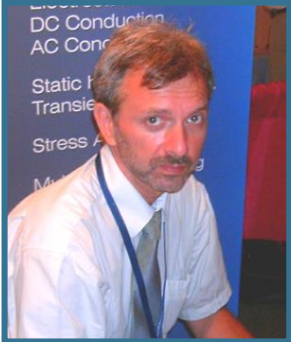




# High voltage engineering simulations with QuickField



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

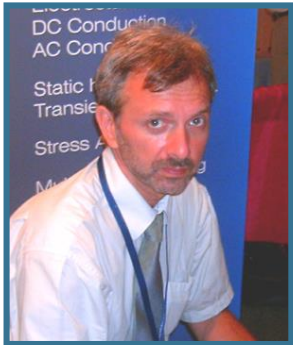


**Alexander Lyubimtsev  
Support Engineer  
Tera Analysis Ltd.**



High voltage engineering  
simulations with QuickField.

# QuickField Overview.



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



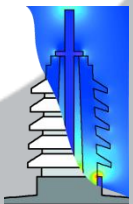
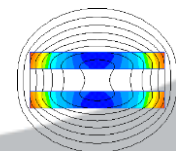
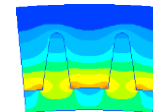
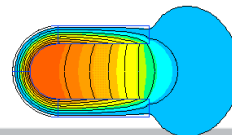
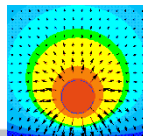
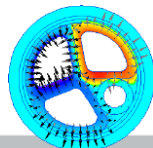
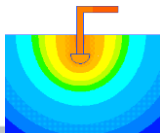
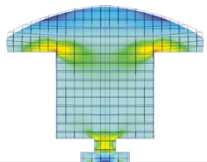
# High voltage engineering





# QuickField Analysis Options

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

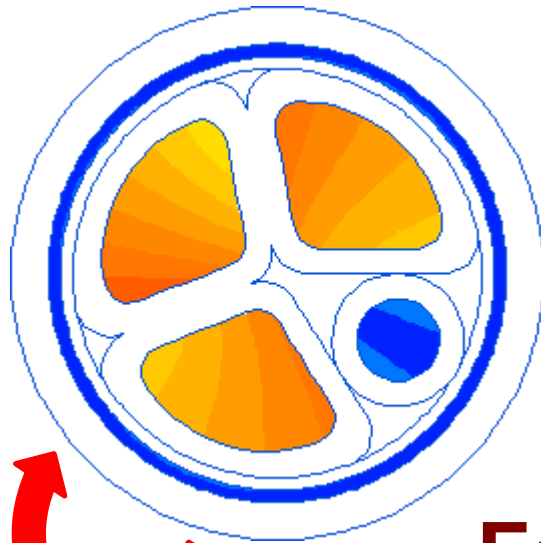




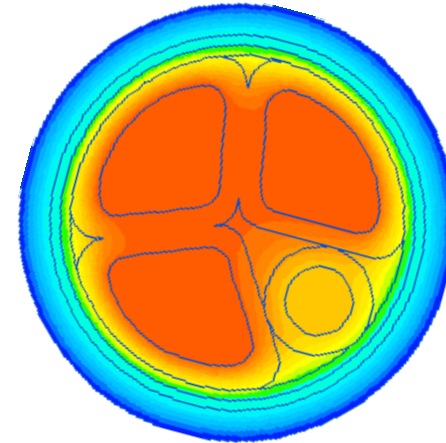
# MultiPhysics

Temperature  
Field

Electromagnetic  
fields

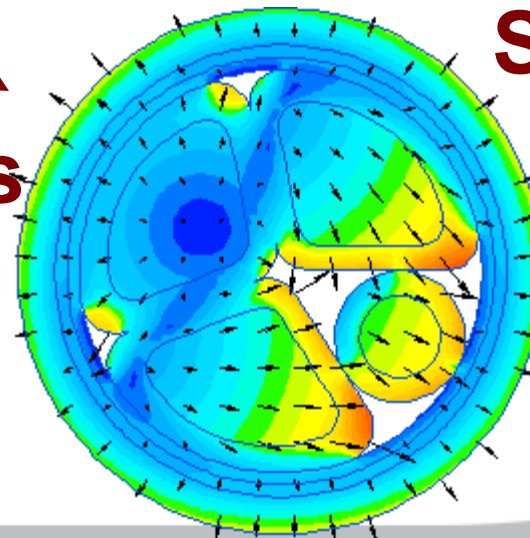


Losses



Thermal  
Stresses

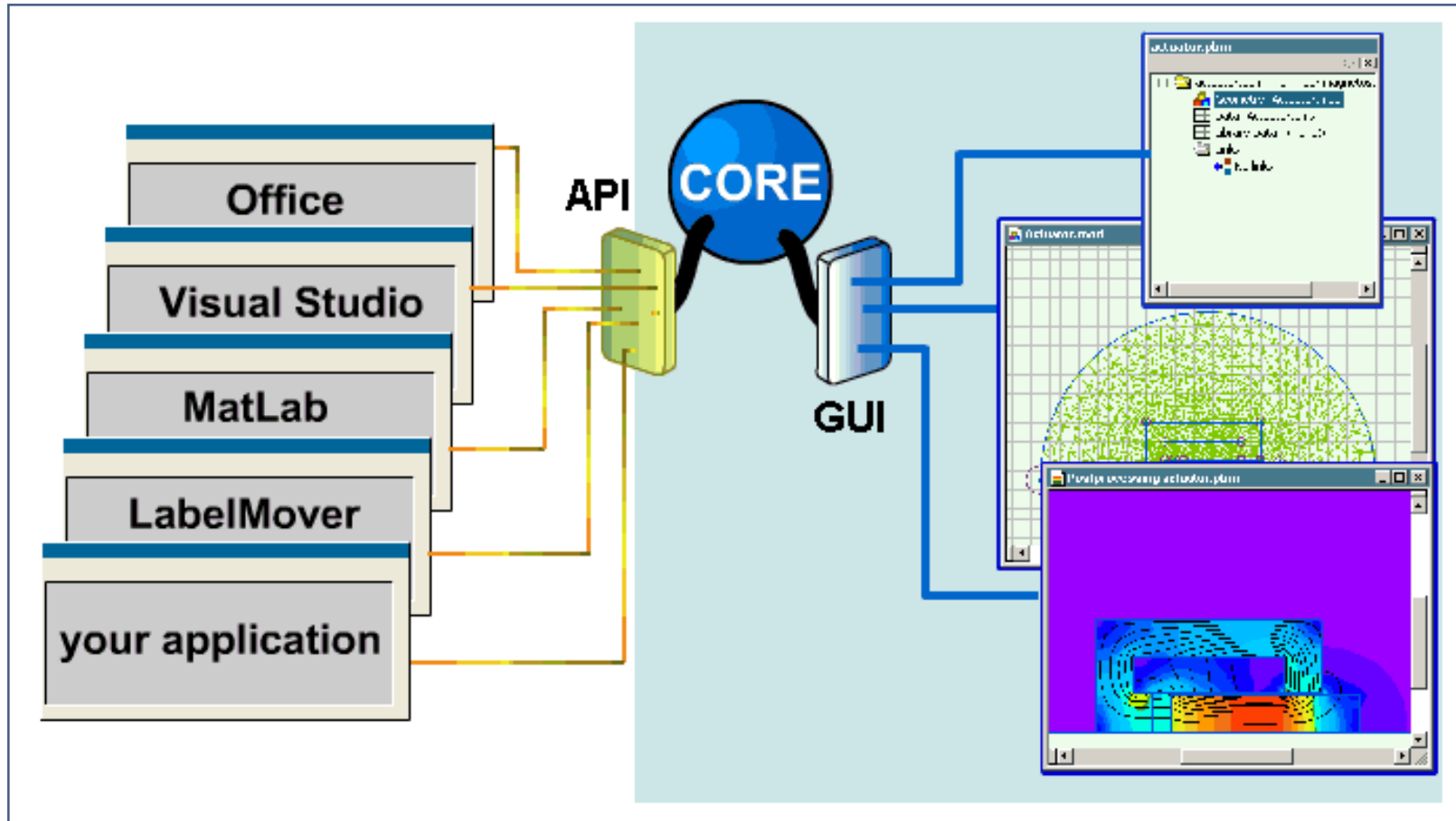
Forces



Magnetic state  
import

Stresses &  
Deformations


# Open object interface





# Free ActiveField based tools



Language: 

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[Main](#) >> [Downloads](#) >> [Free utilities to extend QuickField capabilities](#)

## Free tools




*free utilities*

These tools are distributed in source codes on "as is" basis. They may be used for their specific tasks, or as examples and templates of [QuickField Programming](#). They are not necessarily production quality and have minimal, if any, documentation.

Depending on the used technology, tools may be run from within QuickField (like [Add-ins](#) included into QuickField distributive), run independently and then [interact with QuickField](#) on any Windows platform (*vbs* files) or even require some third party application to run (Microsoft Office for VBA). This is shown in the **Type** column of the table below.

- QUICKFIELD
- STUDENT EDITION
- USER MANUAL
- DATA LIBRARIES
- VIDEO
- FREE TOOLS

- [QuickField Student Edition](#)
- [User manual](#)
- [Data Libraries](#)
- [Video](#)
- [Free tools](#)

Tool name	Type	Source Code Language
<a href="#">Add labels to contour</a> Add blocks or edges to contour by their labels.	HTML Application (HTA)	JavaScript
<a href="#">AC Magnetic and Heat Transfer Double Coupling iterator</a> Iterative solution of two mutually coupled AC Magnetic and Heat Transfer QuickField problems  <a href="#">Video</a>	Microsoft Excel 2010 document	<a href="#">VBA</a>
<a href="#">AnimationToPPT</a> Picture export from QuickField result window to Power Point presentation  <a href="#">Video</a>	Microsoft PowerPoint 2010 document	<a href="#">VBA</a>
<a href="#">Core loss coefficients calculator</a> Core loss coefficients calculator is used to calculate the core loss coefficients on given dataset 	Microsoft Excel 2013 document	<a href="#">VBA</a>





# QuickField Difference







High voltage engineering  
simulations with QuickField.

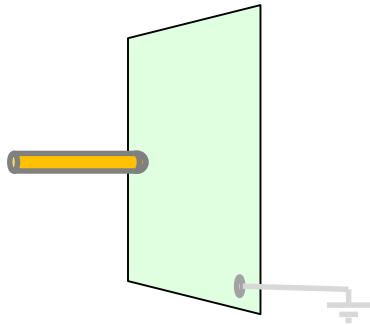
## Live presentations.



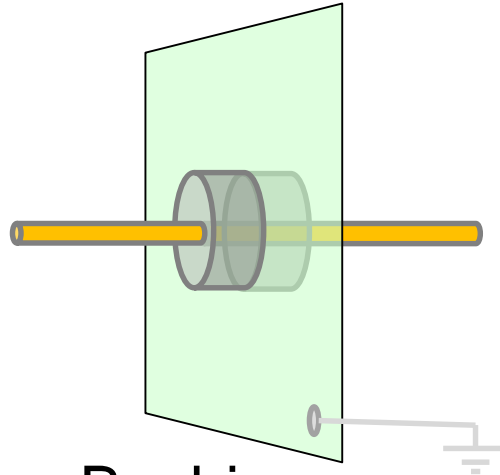
**Alexander Lyubimtsev**  
**Support Engineer**  
**Tera Analysis Ltd.**



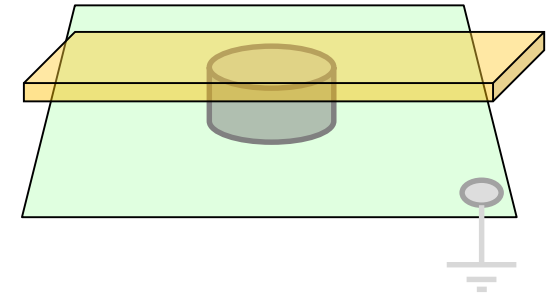
# High voltage engineering simulation with QuickField



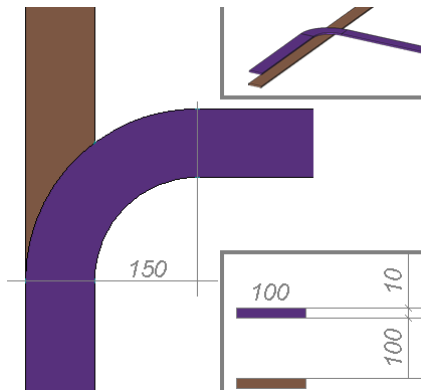
Needle to plane



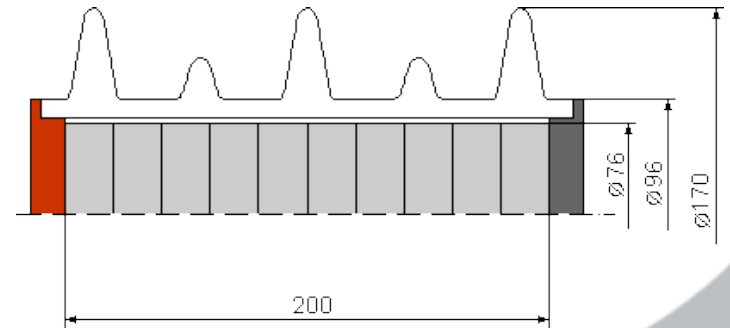
Bushing optimization



Supporting insulator



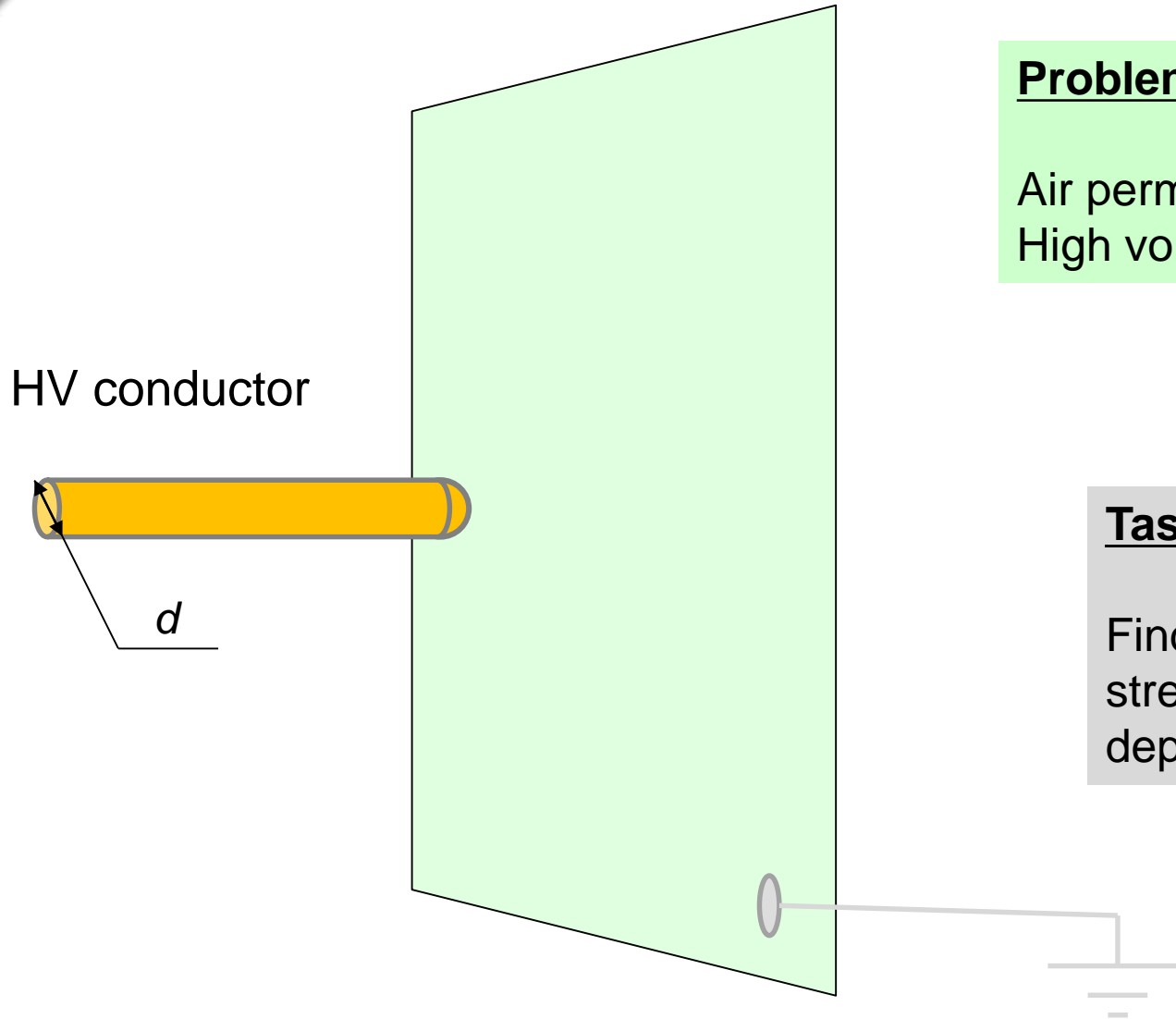
Bus-bars



Solid-state arrester



# Needle to plane



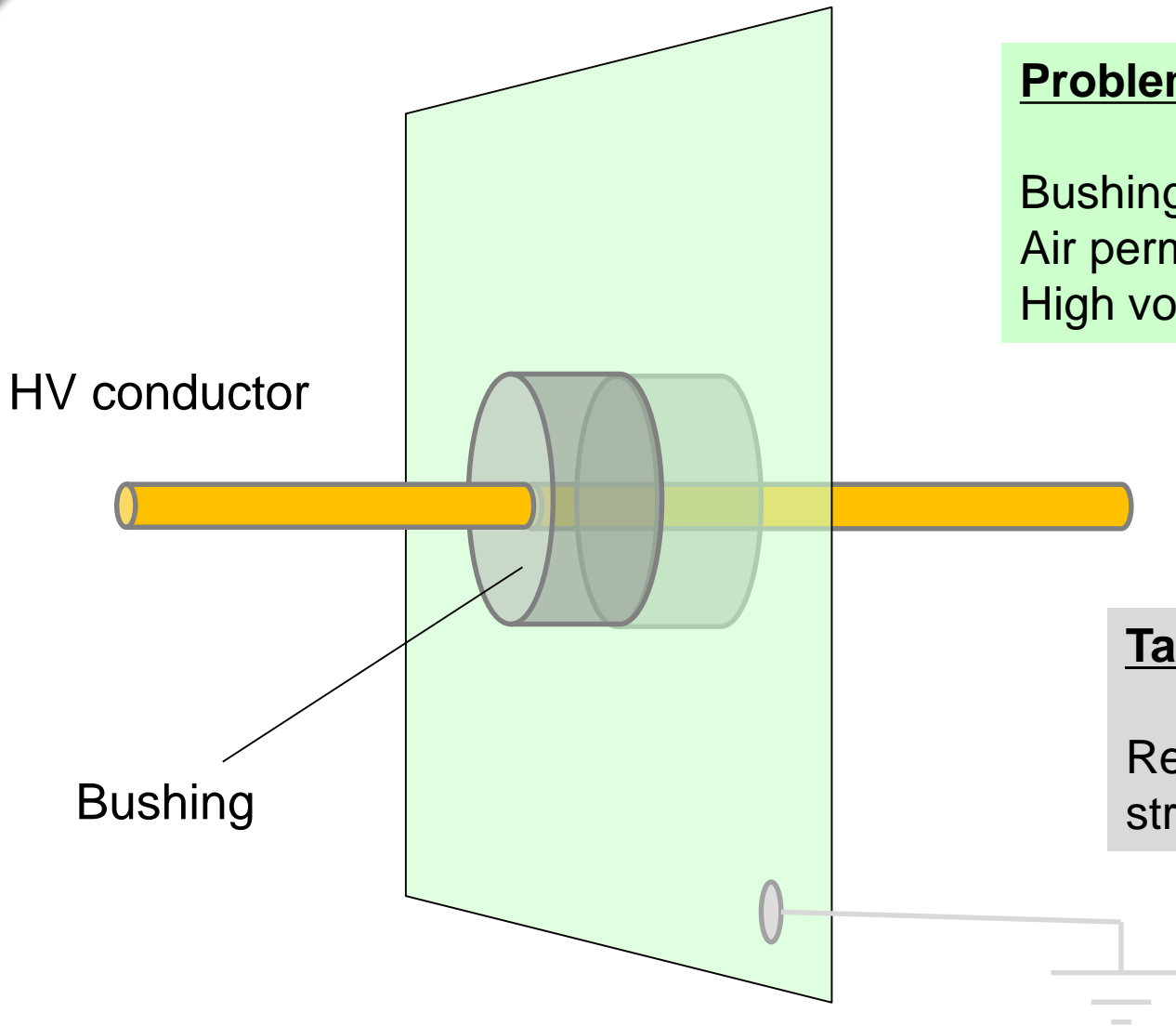
## Problem specification:

Air permittivity:  $\epsilon = 1$   
High voltage 10 kV

## Task:

Find maximal electric field stress vs. needle diameter dependency

# Bushing optimization



## Problem specification:

Bushing permittivity:  $\epsilon = 2.4$

Air permittivity:  $\epsilon = 1$

High voltage 10 kV

## Task:

Reduce electric field stress in insulation

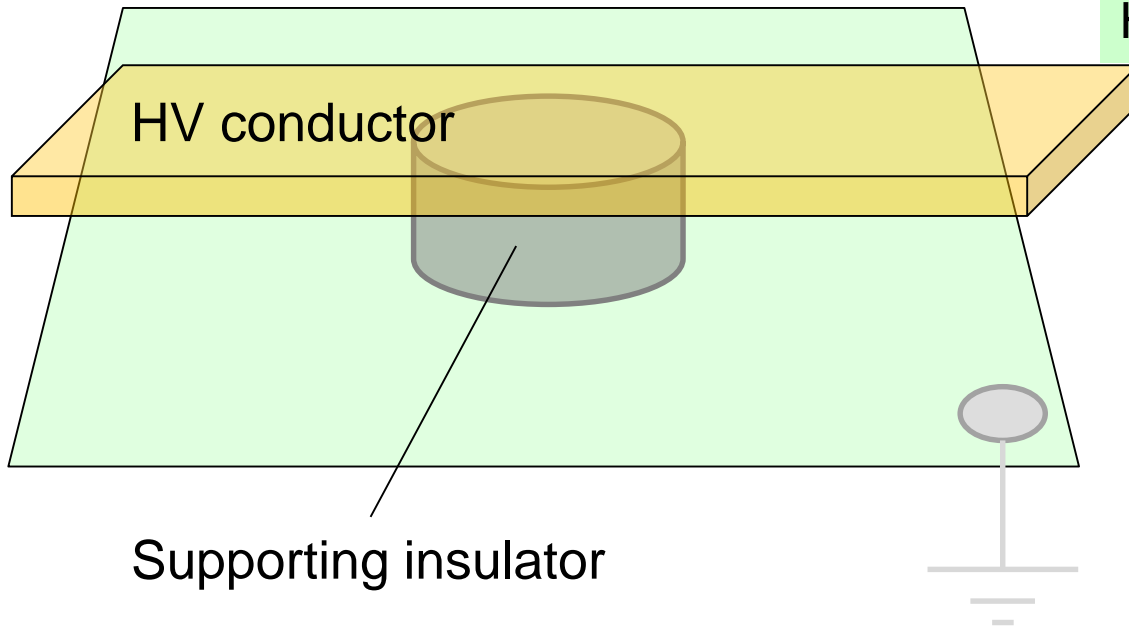
# Supporting insulator 3D

## Problem specification:

Bushing permittivity:  $\epsilon = 2.4$

Air permittivity:  $\epsilon = 1$

High voltage 10 kV

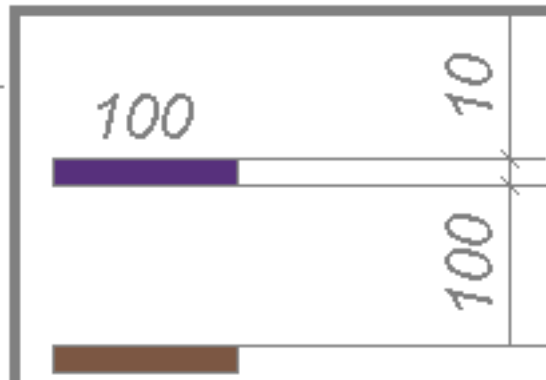
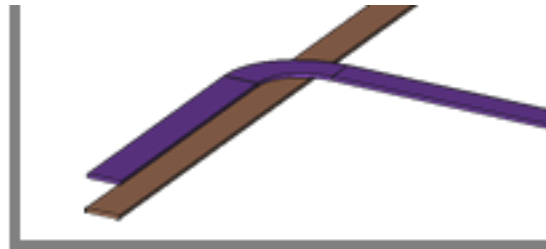


## Task:

Reduce electric field stress in insulation



# Bus bars 3D



## Problem specification:

SF6 permittivity:  $\epsilon = 6$

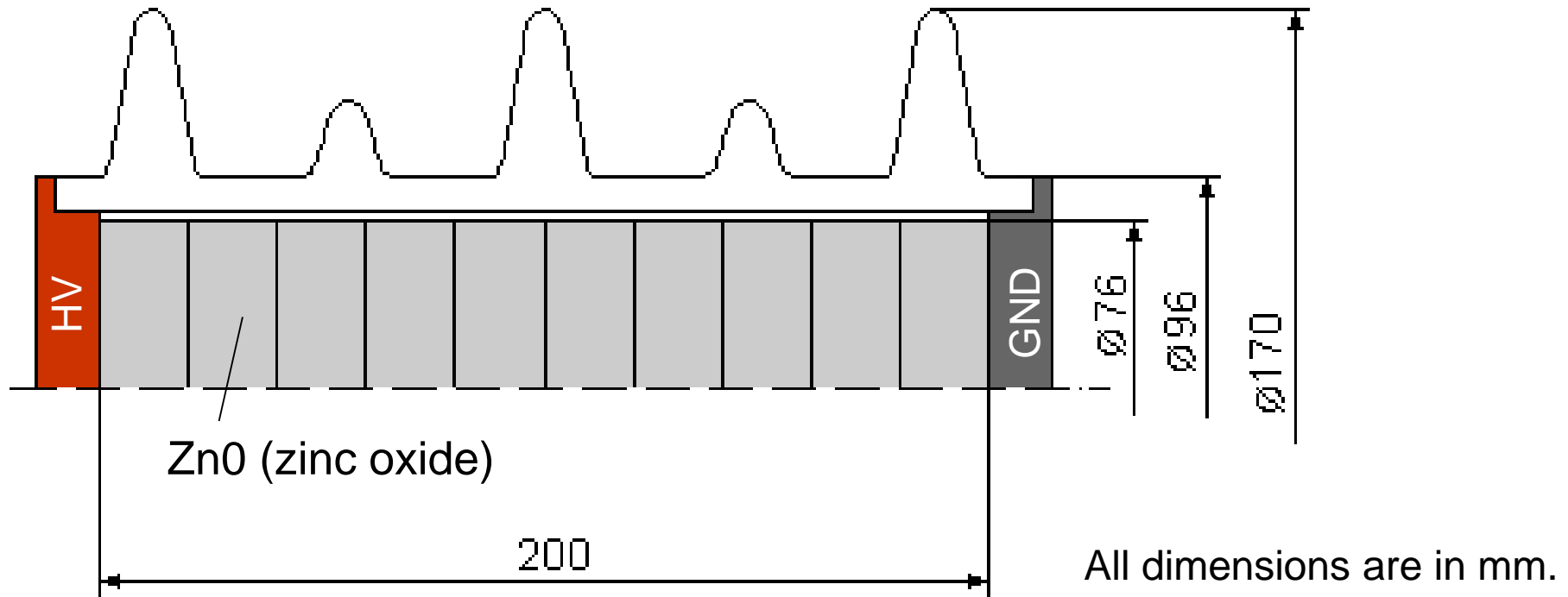
Potential difference 10 kV

## Task:

Calculate electric field stress distribution.



# Solid state surge arrester

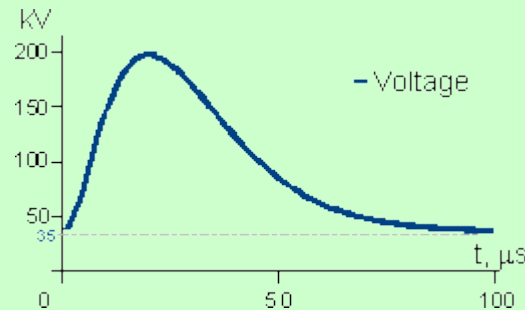


## Problem specification:

Rate voltage  $U = 35$  kV

ZnO permittivity  $\epsilon = 60$

ZnO conductivity  $\sigma = \sigma(E)$



## Tasks:

Calculate surge pulse transient current