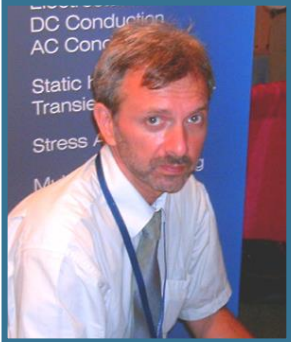




# Free QuickField tools. Part 2



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

QuickField core and expansions



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

Free QuickField Tools



# Free tools list on website

www.quickfield.com

**QuickField**  
A new approach to field modelling

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## Free tools

*free utilities*

These tools are distributed in source codes on "as is" basis. 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.

### Online tools

- [BH curve permeability calculator](#)  
This tool converts normal BH-curve to intrinsic and calculates differential and linear magnetic permeability.
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This calculator facilitates complex numbers (phasors) arithmetic operations: impedance and power calculation.
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Core loss coefficients calculator is used to calculate the core loss coefficients on given dataset.
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# QuickField webinar archive

www.quickfield.com



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**Webinars archive**

*finite element method simulation videos*

Here you can download and view video recordings:

April 25, 2019. Physical laws simulation with **Free webinar April 25, 2019**

November 15, 2018. What's new in QuickField 6.3 SP2 **Free webinar: November 15, 2018**

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- Customer login
- Glossary
- Help
- FAQ



# Free tools in webinar archive

www.quickfield.com

May 13, 2015

April 22, 2015. [Electric circuit analysis with QuickField](#)



March 4, 2015. [Power cable design with QuickField](#)



January 28, 2015. [QuickField free tools](#)



December 10, 2014. [Capacitors simulation with QuickField](#)



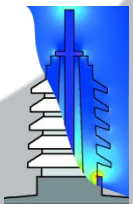
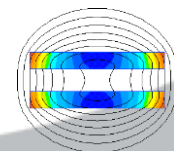
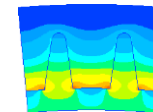
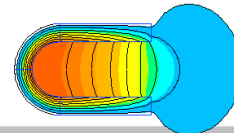
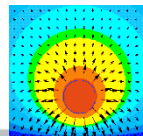
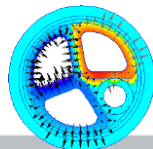
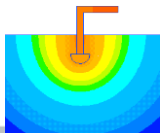
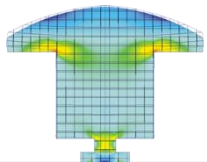
October 15, 2014. [Power transmission lines simulation with QuickField](#)





# QuickField Analysis Options

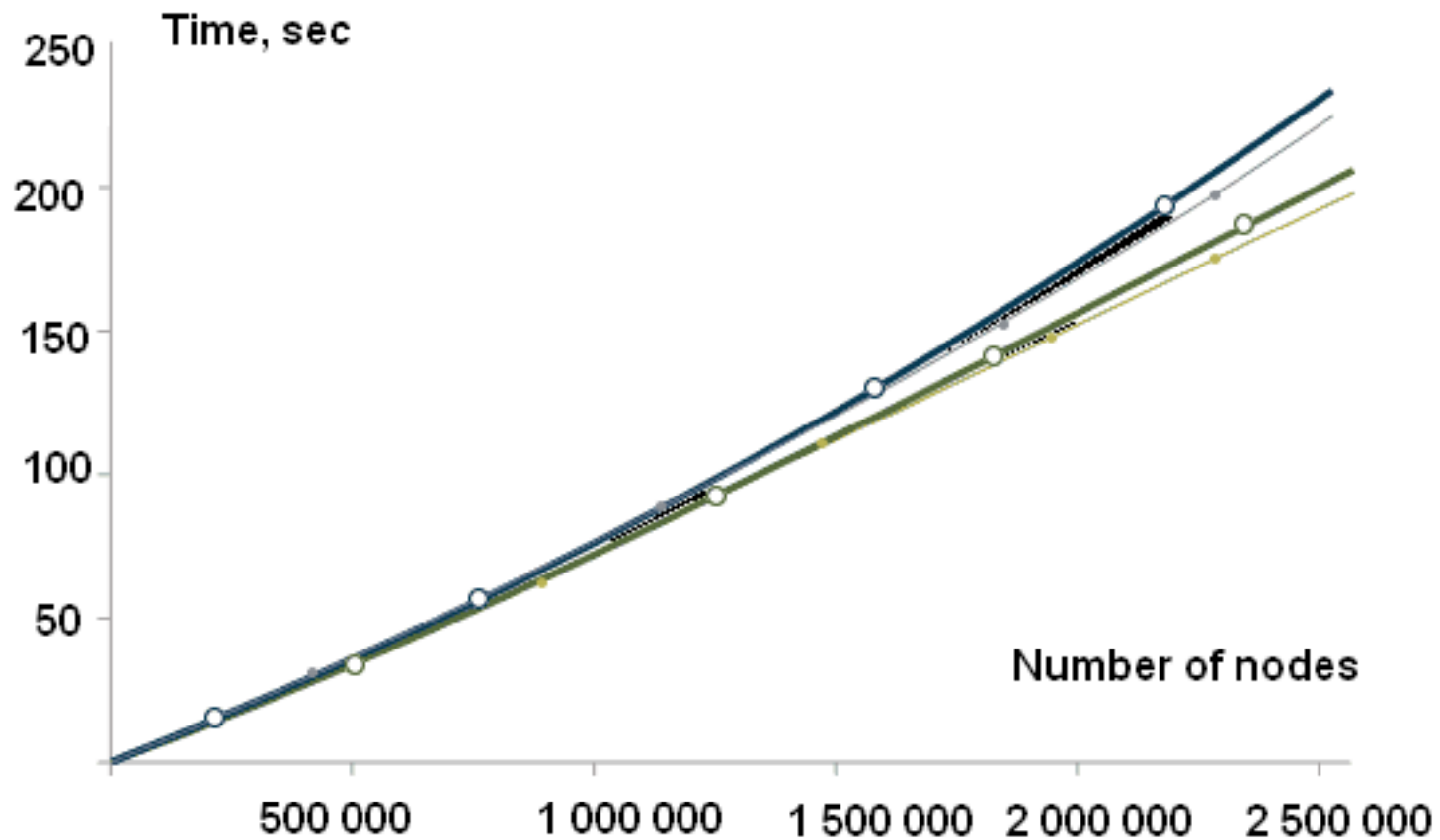
Magnetic analysis suite	
Magnetic Problems	Magnetostatics
	AC Magnetics
	Transient Magnetics
Electric analysis suite	
Electric Problems	Electrostatics and DC Conduction
	AC Conduction
	Transient Electric field
Thermostructural analysis suite	
Thermal and mechanical problems	Steady-State Heat transfer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





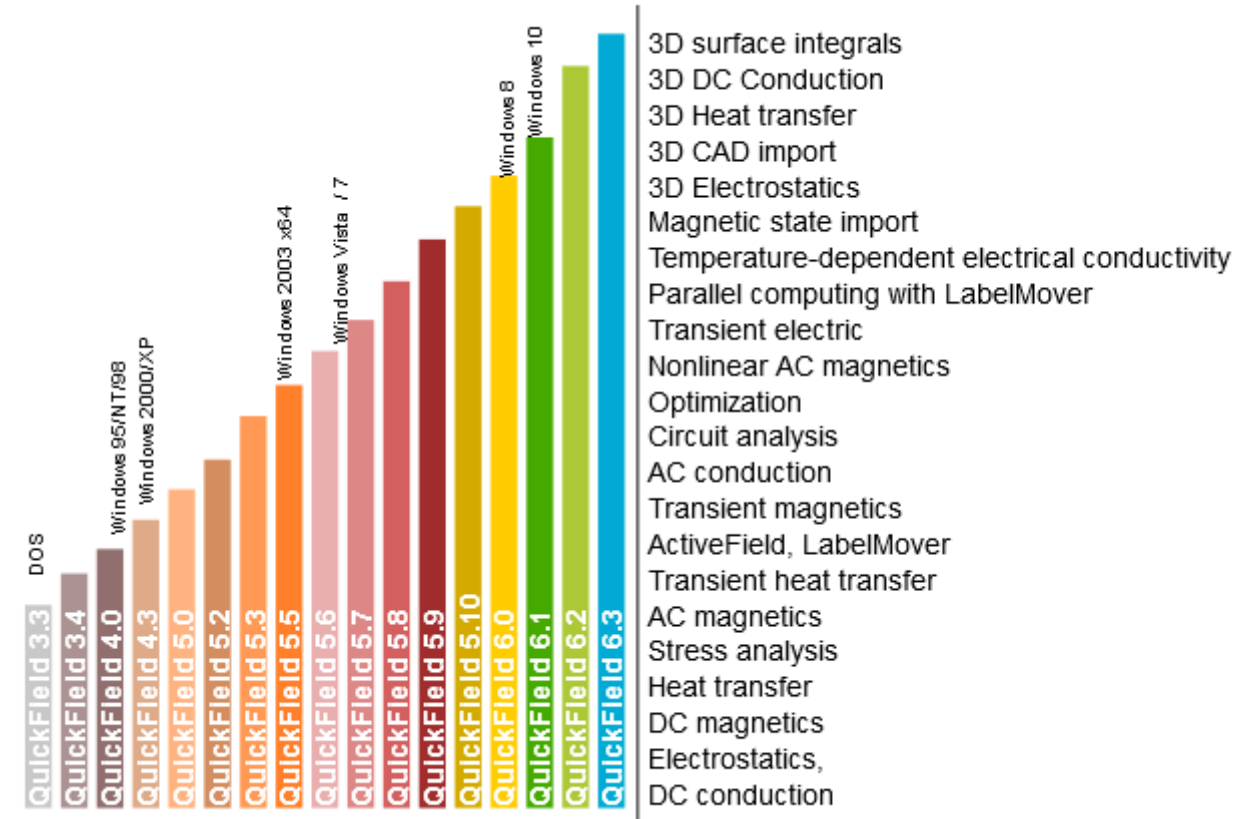
# QuickField solvers

Solution time for various sizes of finite element mesh





# QuickField version history







# ActiveField API object model

ActiveField™ help

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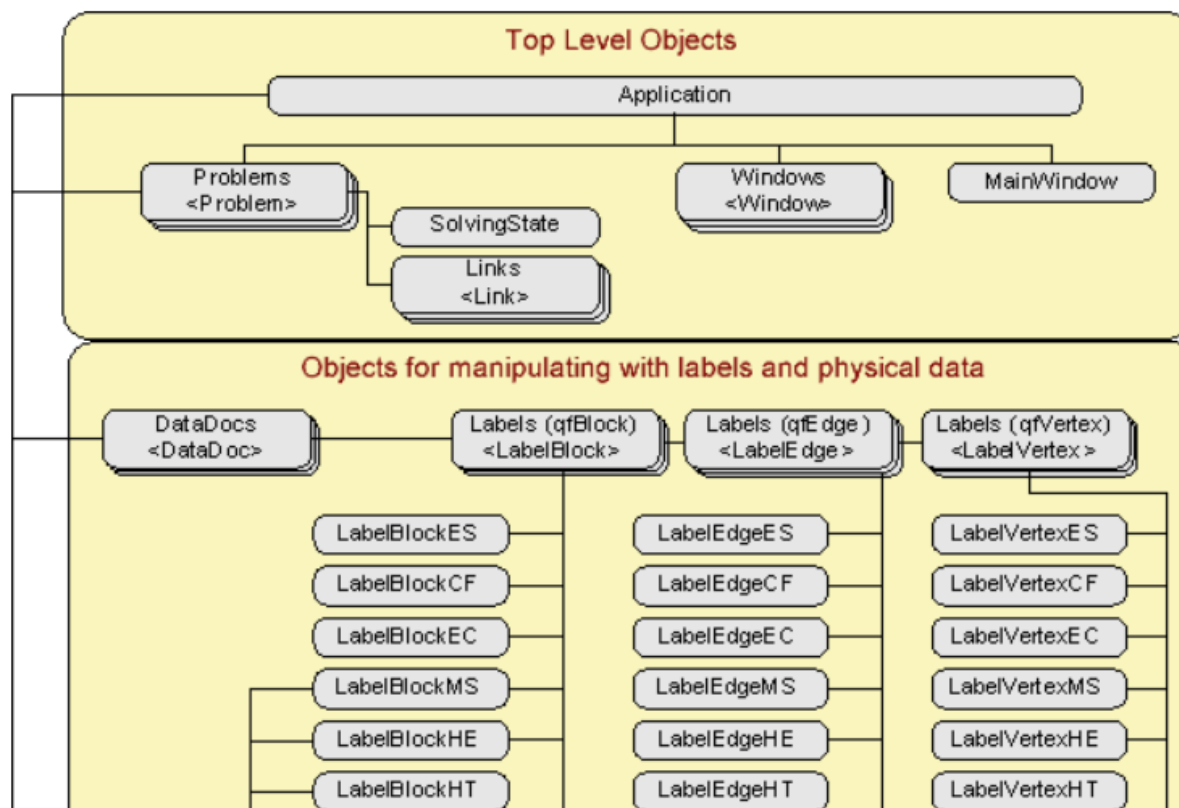
- ActiveField Technology
- Objects Overview
- Hierarchy Chart
- How to Start: Application Object
- How to work with Problems
- How to work with Model
- How to work with Data
- How to Analyze Results

Objects

Properties

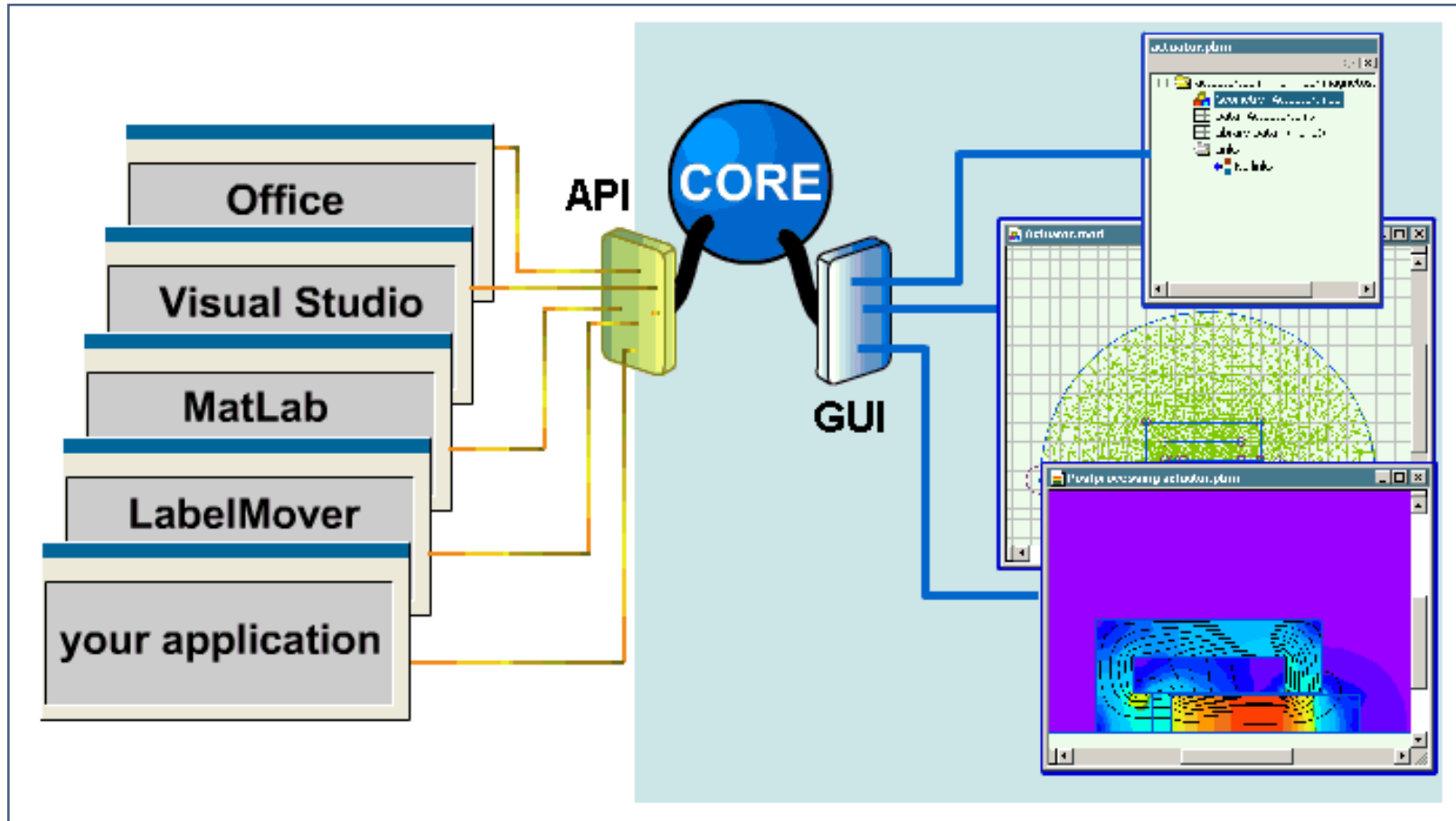
Methods

## QuickField Object Model



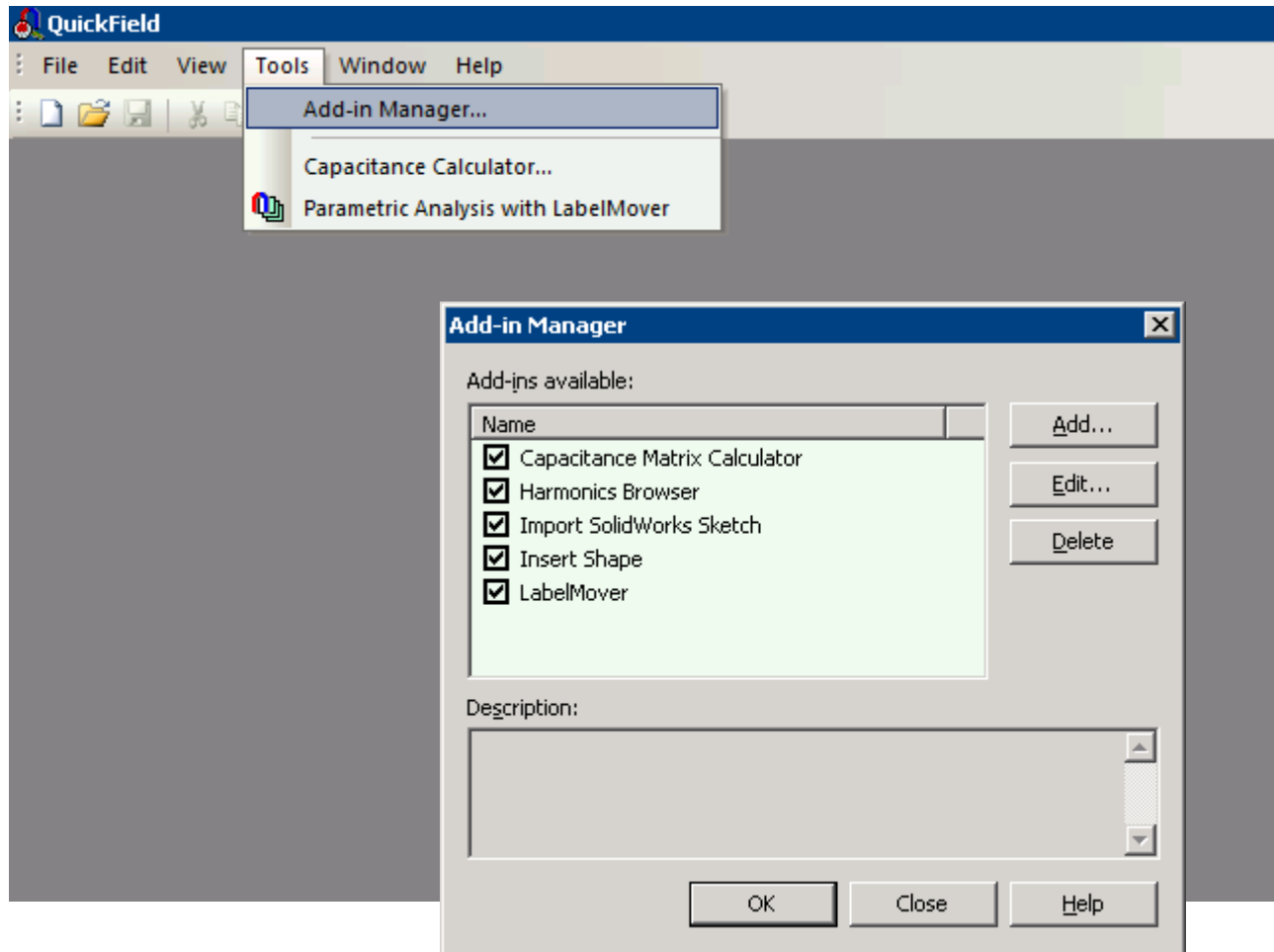


# Open object interface



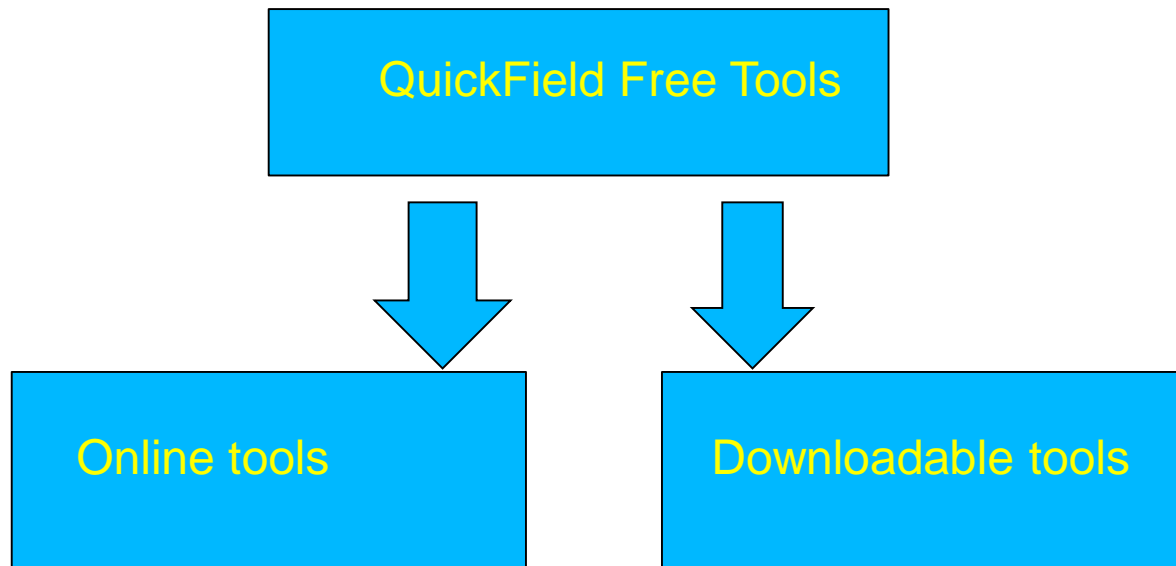


# QuickField add-ins





# QuickField Free Tools





# QuickField Free Tools

Free utilities to extend QuickField X

quickfield.com/free\_tools.htm

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**Free tools**

*free utilities*

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- [Core loss coefficients calculator](#)  
Core loss coefficients calculator is used to calculate the core loss coefficients on given dataset.
- [Harmonics analysis](#)  
This script can perform harmonic analysis for input data of any nature. You can copy data from QuickField time-tables or LabelMover results and automatically calculate the magnitude and phase of any harmonic specified by its number.
- [QuickField formula plotter](#)  
This simple tool helps construing QuickField formulas by plotting the corresponding 2D charts.
- [Natural convection coefficient calculator](#)  
This calculator provides the natural convection coefficient for some predefined surface types.
- [Exported field plotter](#)  
QuickField is capable of exporting the field to a text file. Exported Field Plotter visualizes the exported data.

**Download-able 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 iterstor</a>		



# More QuickField tools



At previous webinar (Jan 2015) :

1. Animation to PowerPoint,
2. StressDeform,
3. Linear contour in cylindrical problem,
4. Cylinder PM force 3D



# Free QuickField tools

1. Simulation report generator
2. Electric field lines.
3. Add labels to contour
4. QuickField formula plotter
5. BH-curve permeability calculator
6. Power and impedance phasor calculator
7. Harmonic analysis
8. Exported field plotter



# Simulation report generator

Microsoft Word document with macros that automates simulation problem report generation.

The screenshot shows a Microsoft Word window with the title 'report\_generator.docm - Word'. The ribbon includes 'PAGE LAY', 'REFERENC', 'MAILINGS', 'REVIEW', and 'VIEW'. The page number '12' is visible in the bottom right corner. The document content is as follows:

[Labelled Objects](#)   [Results](#)   [Nonlineardependencies](#)

## QuickField simulation report

This document includes macros that automate the QuickField simulation report generation. To generate a report:

1. Open this document and make sure the macros are enabled.
2. Run QuickField and open the simulation problem.
3. Make sure the problem is solved and the field picture could be displayed.
4. Click on "Clear old data" button.
5. Click on "Make Report" button to automatically insert data into this document and generate the corresponding PDF file.

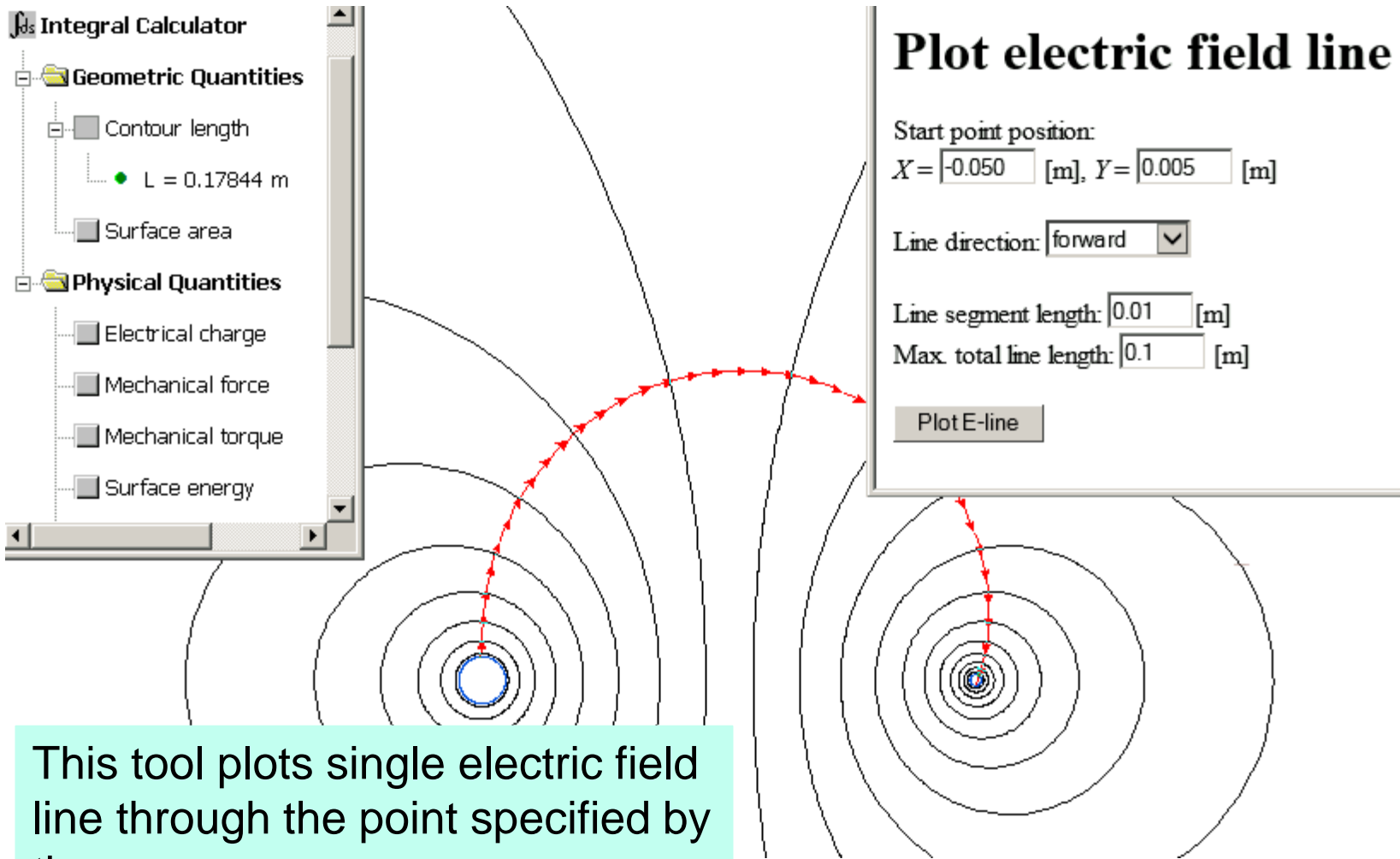
 

This automatic report includes five parts:



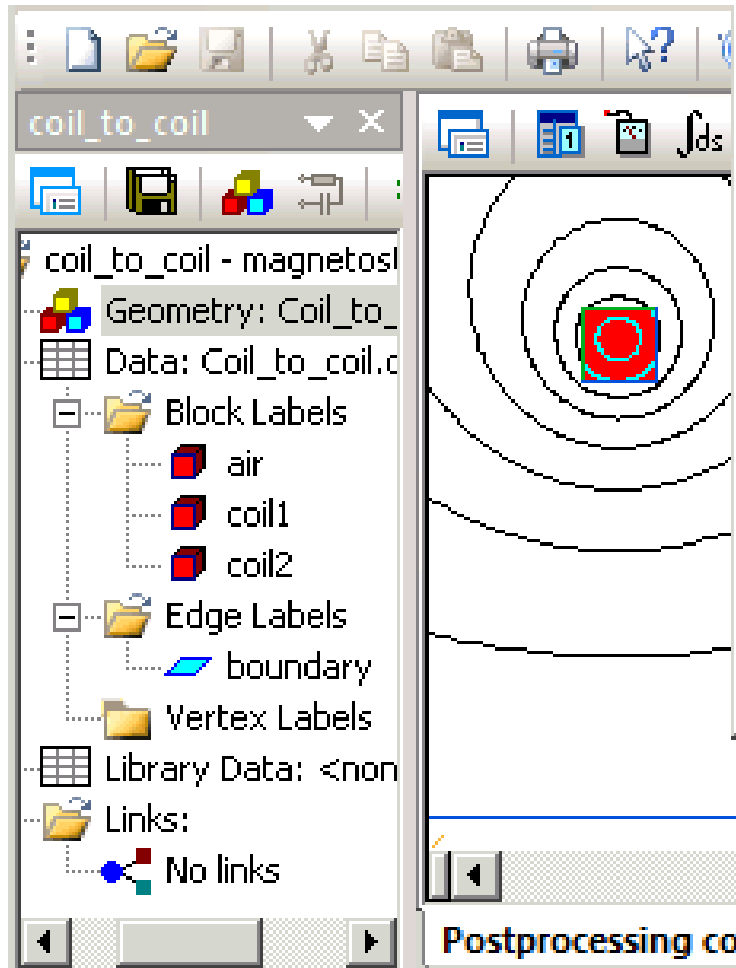


# Electric field lines



This tool plots single electric field line through the point specified by the user.

# Add labels to contour



## Add labels to contour

### Block labels

Add

air  
coil1  
coil2

### Edge labels

Add

boundary

QuickField result analysis often requires the integral calculation across the contour, which combines many blocks or edges.



# QuickField formula plotter

QuickField formulas may be time and coordinate dependent. This tool helps to construct QuickField formula using waveform templates or custom definition and plot it as a function of one variable for specified values of other parameters.

Choose your variable:

Waveform template:

Peak amplitude,  $V_m$ :

Period:  [sec]

Rise time:  [sec]

Duration:  [sec]

Fall time:  [sec]

Delay:  [sec]

## QuickField formula:

$(10*\sqrt{2}) * (\text{saw}(t-0.01, 0.005, 0.05-0.005) + \text{saw}(0.02+0.005+0.005-t+0.01, 0.005, 0.05-0.005))$

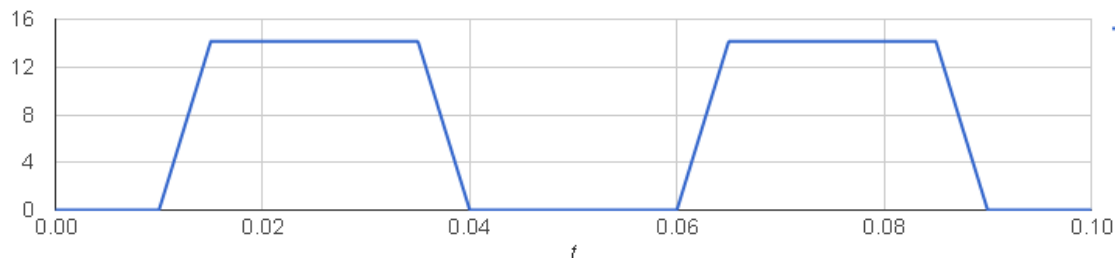
## Plotting parameters

Independent variable 't' range:  ..

Number of steps:

Other argument values for plotting:

$t =$ ,  $x =$ ,  $y =$ ,  $z =$ ,  $r =$ ,  $\phi =$



QuickField formulas may be time and coordinate dependent. This tool helps to construct QuickField formula using waveform templates or custom definition and plot it as a function of one variable for specified values of other parameters.



# BH-curve permeability calculator

## QuickField BH-curve permeability

free tool for QuickField simulation software, intrinsic magnetization curve

QuickField uses normal BH magnetization curve model. In fully saturated material slope (differential relative magnetic permeability) should be equal to unity. To find differential magnetic permeability for a given BH-curve using following equations:

$$B = \mu * \mu_0 * H,$$

where

$\mu_0=4*\pi*10^{-7}$  - permeability of free space [H/m],

$\mu$  - relative permeability of media,

$B$  - magnetic flux density [T],

$H$  - magnetic flux strength [A/m],

### Input data

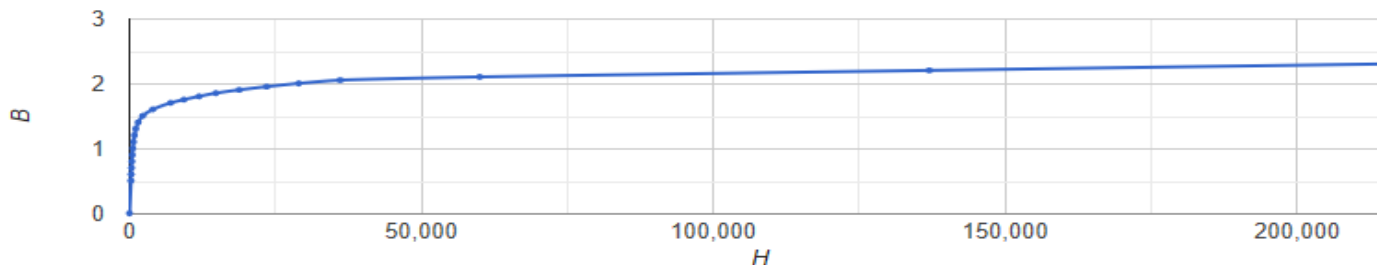
units: H  B

columns order:

0	0
0.5	250
0.6	295
0.7	345
0.8	405
0.9	480
1	570
1.1	690
1.2	845
1.3	1080

### Output data

0	0
0.5	250
0.6	295
0.7	345
0.8	405
0.9	480
1	570
1.1	690
1.2	845
1.3	1080



QuickField uses normal BH curve model. There are other curve types, for example *intrinsic magnetization curve (M vs. H)*.

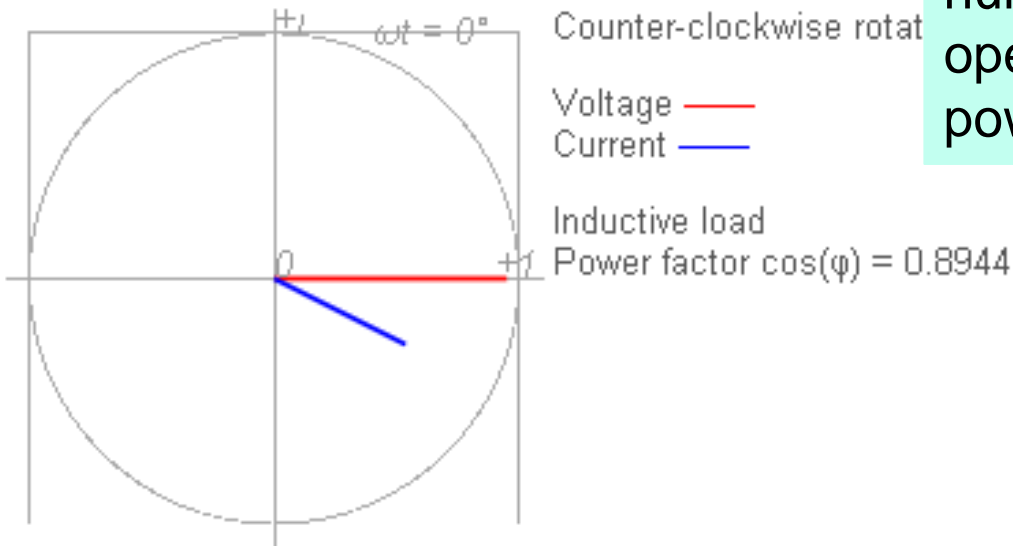
This tool converts data from one representation to another.



# Power and impedance phasor calculator

	Real (Re)	Imaginary (Im)
Voltage magnitude $V$ [V]	<input type="text" value="310"/>	$i * $ <input type="text" value="0"/>
Current magnitude $I$ [A]	<input type="text" value="10"/>	$i * $ <input type="text" value="-5"/>
<input type="button" value="Calculate"/>		
Impedance $Z = V / I$ [Ohm]	<input type="text" value="24.8"/>	$i * $ <input type="text" value="12.4"/>
Power $S = \frac{1}{2} * (V * I^*)$	<input type="text" value="1550"/> W	$i * $ <input type="text" value="775"/>

Negative value indicates that power is generated.



AC magnetic problems utilize complex numbers arithmetic to represent values sinusoidally varying in time.

This calculator facilitates complex numbers (phasors) arithmetic operations: impedance and power calculation.



# Harmonic analysis

[Main](#) >> [Downloads](#) >> [Harmonics analysis](#)

## Harmonics analysis

free tool for QuickField, harmonics analysis online, Fourier decomposition

QuickField provides built-in Harmonic analysis utility. However, it works with space-distributed values only. Sometimes it is required to find the harmonics of other dependencies.

Here you can find the script that can perform harmonic analysis for input data of any nature. You can copy data from QuickField time-tables or LabelMover results and automatically calculate the magnitude and phase of any harmonic specified by its number.

Calculate harmonic of order

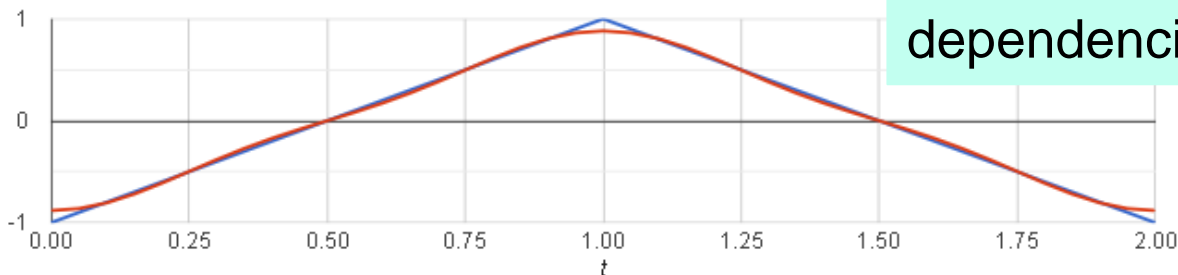
Input data:

0	-1
0.05	-0.9
0.1	-0.8
0.15	-0.7
0.2	-0.6
0.25	-0.5
0.3	-0.4
0.35	-0.3
0.4	-0.2
0.45	-0.1
0.5	0

Harmonics  $f(t) = A \sin(k * 2 * \pi * t / \text{period} - \text{phase})$   
period=2

#k	A	phase (deg)
#1	0.7924275063297002	-90
#2	1.361760672861838e-16	72.646
#3	0.08951083987665974	-90

Mean square error 0.02202716801522323



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[User manual](#)

[Data Libraries](#)

[Video](#)

[Free tools](#)

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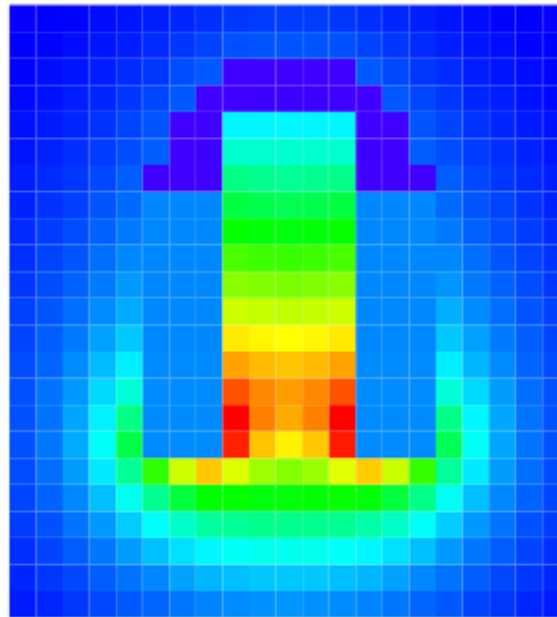


# Exported field plotter

Paste the file content in the field below or browse for the file.

<input type="button" value="Browse..."/>	No file selected.	<input type="button" value="Process data"/>	
21	23	4	
x_(cm)	y_(cm)	B_(T)	H_(A/m)
-5.00000	-3.00000	0.00576086	4584.34
-4.50000	-3.00000	0.00647296	5151.01
-4.00000	-3.00000	0.00732490	5828.97
-3.50000	-3.00000	0.00833080	6629.44

Select the value to plot:



QuickField is capable of exporting the field to a text file.

Exported Field Plotter visualizes the exported data.