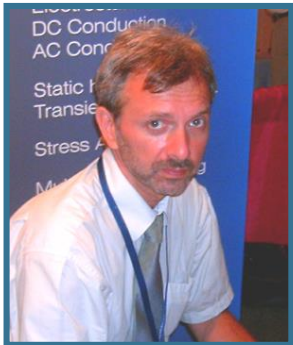




QuickField 5.9 overview



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



QuickField Analysis Options

Magnetic Suite

AC Magnetics

Transient + DC Magnetics

DC Magnetics

Electric Suite

AC conduction + Electrostatics & DC conduction

Transient Electric + Electrostatics & DC conduction

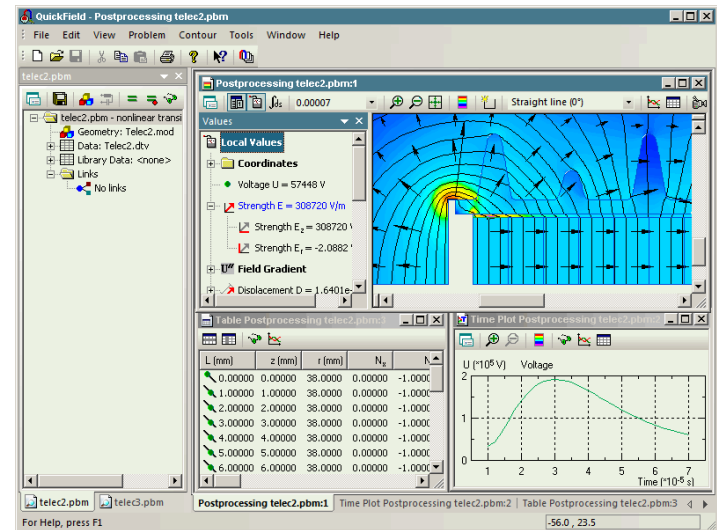
Electrostatics & DC conduction

Thermostructural

Stress Analysis

Transient Heat transfer

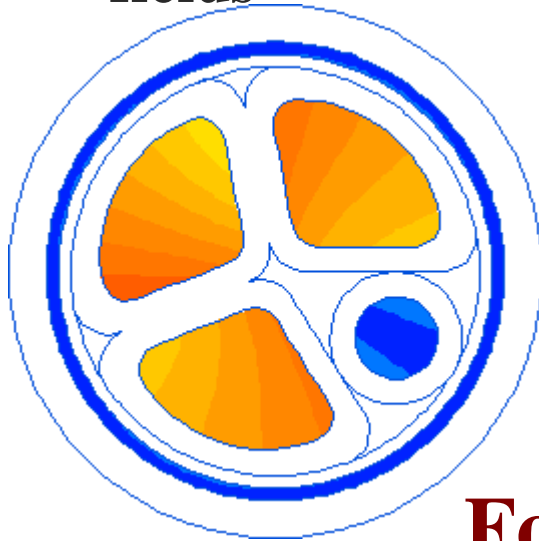
Steady State Heat transfer





MultiPhysics.

Electromagnetic
fields

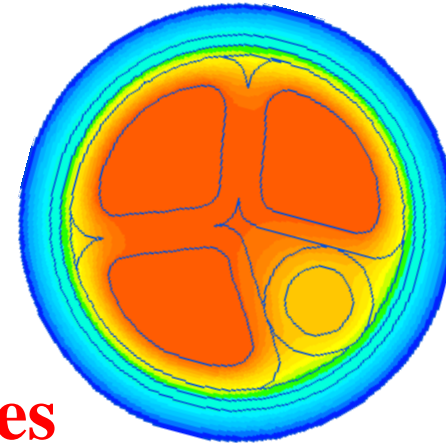


Joule
Heat



Temperatures

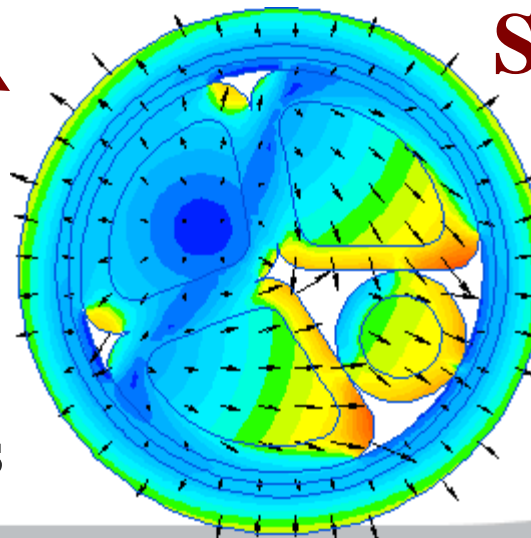
Temperature
Field



Forces



Stresses &
Deformations



Thermal
Stresses





QuickField Difference





Temperature dependent conductivity

$$\rho = \rho_0(T_0)(1 + \alpha(T - T_0))$$

ρ – resistivity at the temperature T;

ρ_0 – resistivity at the initial temperature T_0 ;

α – temperature coefficient

$\sigma=1/\rho$ – conductivity

	Temperature coefficient α (1/degree)	Relative change of the conductivity with the temperature:		
		20 °C	75 °C	100 °C
Silver	0.0038	1	0.82713	0.766871
Aluminum	0.0039	1	0.823384	0.762195
Iron	0.005	1	0.784314	0.714286
Carbon (amorphous)	-0.0005	1	1.028278	1.012658
Silicon	-0.0075	1	1.702128	2.5



Temperature dependent conductivity

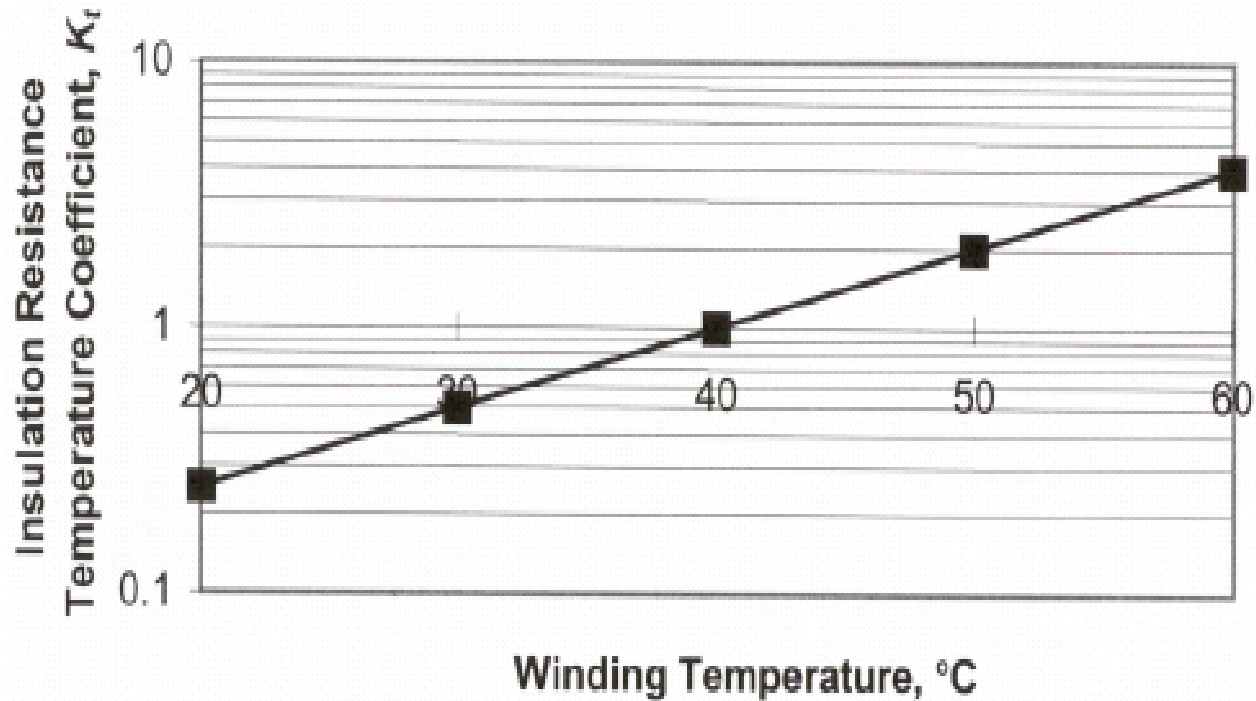


Figure 5— Approximate Insulation resistance coefficient, K_T , for Insulation halving for 10 °C rise in temperature

(From IEEE standard P43-2000 draft)



Temperature-dependent conductivity

The screenshot displays the QuickField software interface. The main window shows a project tree for 'ACpart.pbm' with components like 'air', 'coil', 'posistor (2)', and 'thermocontact'. Two dialog boxes are open:

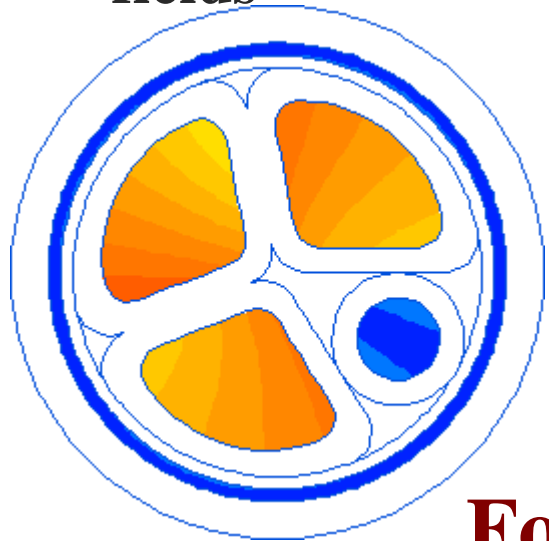
- Block Label Properties - coil**:
 - General**: Permeability $\mu_2 = 1$, $\mu_1 = 1$. Options: Relative, Absolute, Nonlinear, Anisotropic. Coordinates: Cartesian, Polar.
 - Electrical Conductivity**: Edit Curve $\sigma = \sigma(T) \dots$. Depends on Temperature. Temperature: 0 (K).
 - Field Source**: $j_0 = 1000000$ (A/m²), $\varphi = 0$ (Deg). Source Mode: Current Density, Total Current. Conductor's Connection: In Parallel, In Series.
- Curve Edit - coil**:
 - Graph: $\sigma \cdot 10^7$ (S/m) vs Temperature (K). The curve shows a linear decrease from approximately 7.2 at 290 K to 2.2 at 373 K.
 - Table:

	Temperature	Conductivity
	T (K)	s (S/m)
1	290	35000000
2	345	28700000
3	373	26600000



Temperature-dependent conductivity

Electromagnetic fields

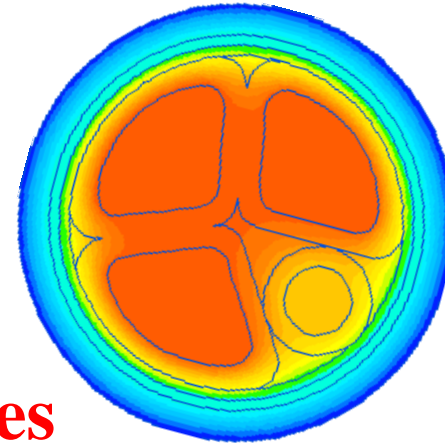


Joule Heat



Temperatures

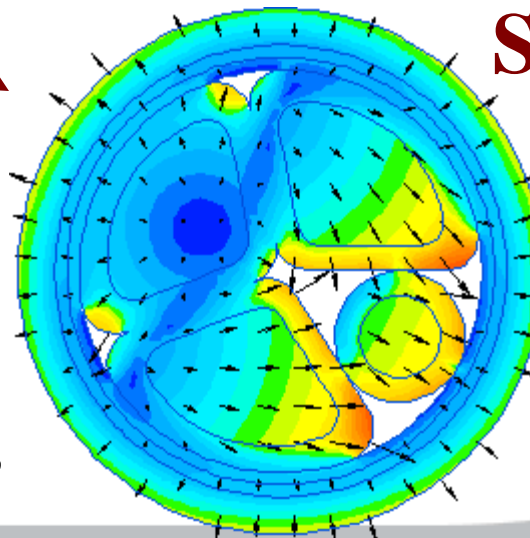
Temperature Field



Forces



Stresses & Deformations



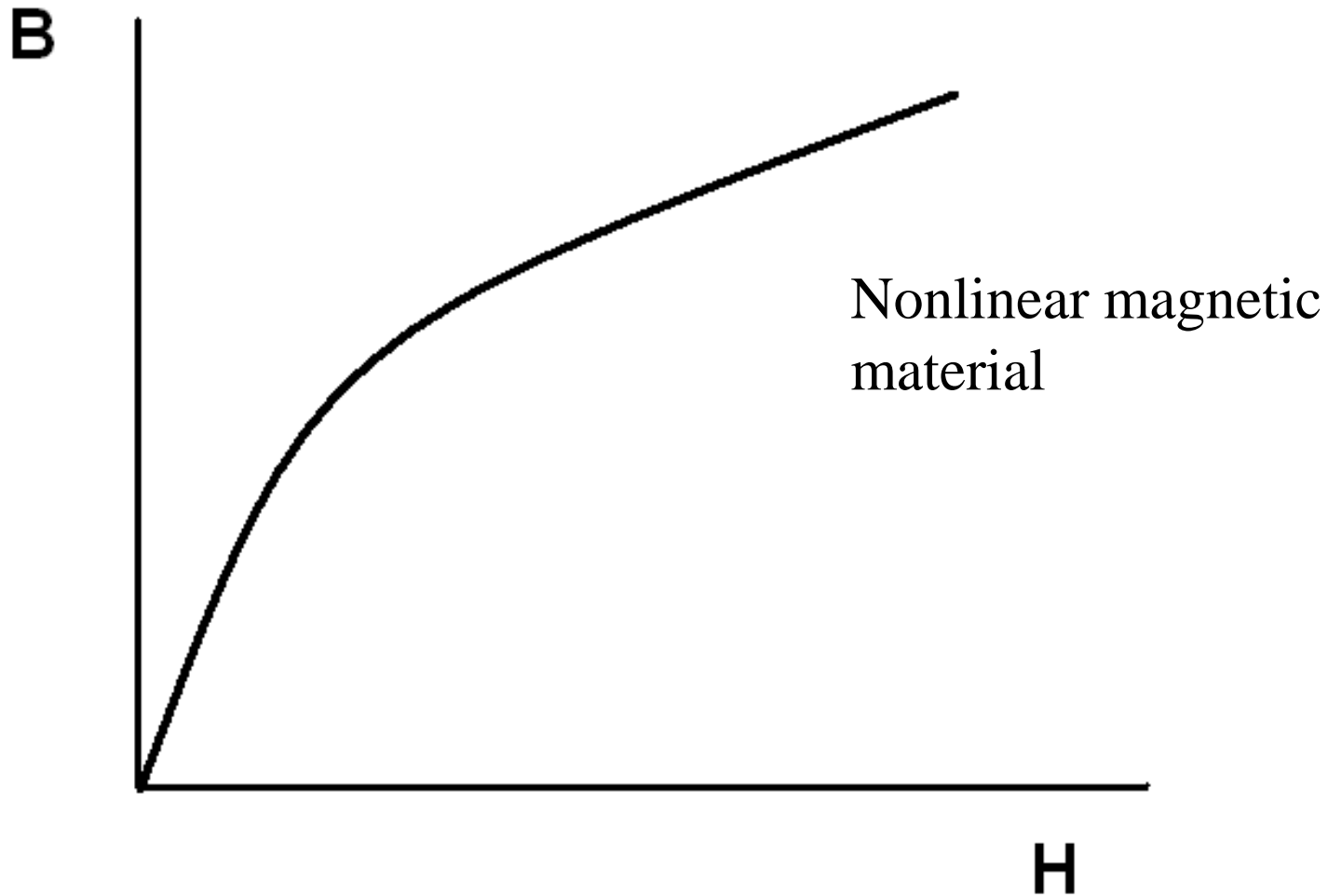
Thermal Stresses



Short poll.
Ask your questions!

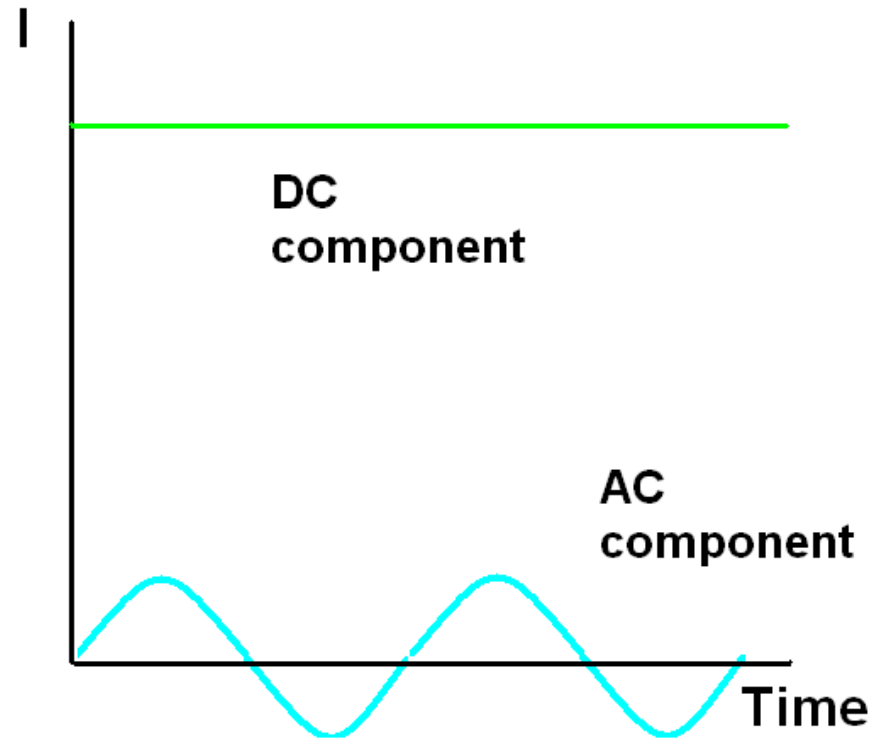
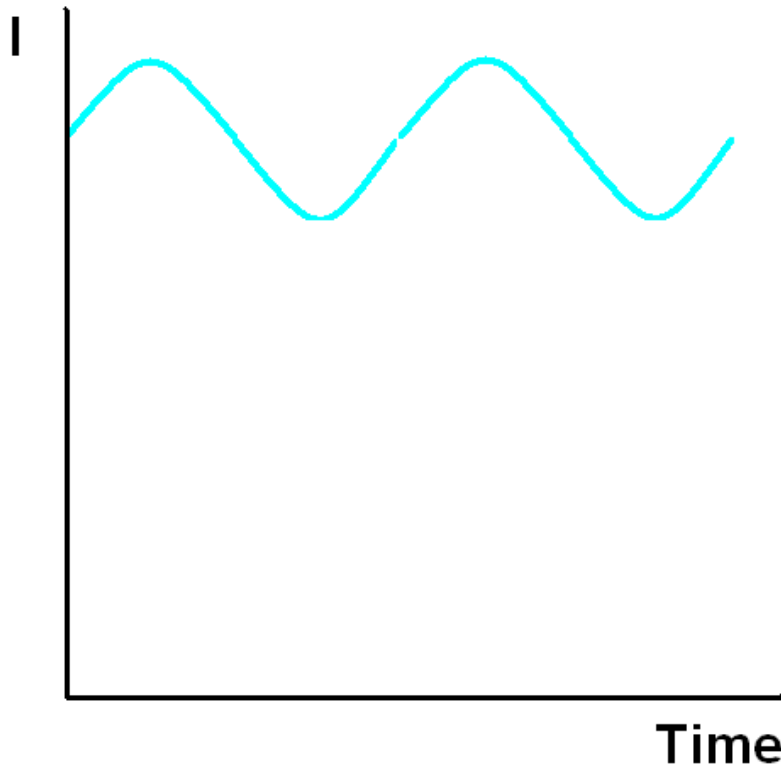


Import of DC-biased magnetic permeability to AC Magnetic problems





Import of DC-biased magnetic permeability to AC Magnetic problems





Import of DC-biased magnetic permeability to AC Magnetic problems





System requirements

- Windows XP, Vista or Windows 7, USB port for copy-protection
- 2 GB RAM for individual simulations OR
- More RAM for parametric studies on a multicore system



How to keep the version current

- One-time update costs 30 % and includes one-year maintenance
- 12 months maintenance with free updates costs 20 % (available for latest version only)
- All new orders go with 3 month maintenance included