

Cooling of a cube with Imposed Surface Temperature

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http://www.giacomo.lorenzoni.name/PEEI_4.0.0.1/Cooling_of_a_cube_with_imposed_surface_temperature/

http://www.giacomo.lorenzoni.name/PEEI_4.0.0.1/PEEIapplDown.aspx?var=4

Cooling of a cube with imposed surface temperature

This text is integrating part of the homonymous link in [PEEI: a computer program for the numerical solution of systems of partial differential equations](#).

Coordinate system: Cartesian

System of measurement: International System of Units

Coordinates of Cartesian system: \underline{x} of which $\underline{x} = \{x_n; n=1,4\} = \{x,y,z,t\}$ $\underline{x}_v = \{x,y,z\}$
 $\{[x_n] = [\text{length}]; n=1,3\}$ $[t] = [\text{time}]$ $\mathcal{R}(\underline{x}_n) = (-\infty, \infty); n=1,4$

Unknown functions: $T(\underline{x})$ of which $[T] = [\text{temperature}]$

Differential analytic model: $\psi \cdot \partial T(\underline{x}) / \partial t - \partial^2 T(\underline{x}) / \partial x^2 - \partial^2 T(\underline{x}) / \partial y^2 - \partial^2 T(\underline{x}) / \partial z^2 = 0$ of which
 $\psi = \rho \cdot c_s / \kappa$ $\rho = 7933$ $c_s = 460$ $\kappa = 20$

Definition set: $\{\underline{x} / 0 \leq x_n \leq \#_n; n=1,4\}$ $\{\#_n = 1; n=1,3\}$ $\#_4 = 3600 \cdot 10$

Conditions: $\{T(\underline{x}_v, 0) = 1; \forall \{0 < x_n < \#_n; n=1,3\}\}$ $\{T(\underline{x}) = 0; \forall \forall_{n=1,3} (\{x_n = 0\} \cup \{x_n = \#_n\})\}$

Related files: [mad.txt](#)

Case 1-1:

Related files: [points-1-1.txt](#), [PEEI-mem-1-1.bin](#), [cond-1-1.txt](#), [PEEI-sol-1-1.txt](#), [plot-1-1.jpg](#)

Case 1-2:

Related files: [points-1-2.txt](#), [PEEI-mem-1-2.bin](#), [cond-1-2.txt](#), [PEEI-sol-1-2.txt](#), [plot-1-2.jpg](#)

Case 1-3:

Related files: [points-1-3.txt](#), [PEEI-mem-1-3.bin](#), [cond-1-3.txt](#), [PEEI-sol-1-3.txt](#), [plot-1-3.jpg](#)

Case 1-4:

Related files: [points-1-4.txt](#), [PEEI-mem-1-4.bin](#), [cond-1-4.txt](#), [PEEI-sol-1-4.txt](#), [plot-1-4.jpg](#)

Case 2-1:

Related files: [points-2-1.txt](#), [PEEI-mem-2-1.bin](#), [cond-2-1.txt](#), [PEEI-sol-2-1.txt](#), [plot-2-1.jpg](#)

Case 2-2:

Related files: [points-2-2.txt](#), [PEEI-mem-2-2.bin](#), [cond-2-2.txt](#), [PEEI-sol-2-2.txt](#), [plot-2-2.jpg](#)

Case 2-3:

Related files: [points-2-3.txt](#), [PEEI-mem-2-3.bin](#), [cond-2-3.txt](#), [PEEI-sol-2-3.txt](#), [plot-2-3.jpg](#)

Case 2-4:

Related files: [points-2-4.txt](#), PEEI-mem-2-4.bin, [cond-2-4.txt](#), [PEEI-sol-2-4.txt](#), [plot-2-4.jpg](#)

Case 3-1:

Related files: [points-3-1.txt](#), PEEI-mem-3-1.bin, [cond-3-1.txt](#), [PEEI-sol-3-1.txt](#), [plot-3-1.jpg](#)

Case 3-2:

Related files: [points-3-2.txt](#), PEEI-mem-3-2.bin, [cond-3-2.txt](#), [PEEI-sol-3-2.txt](#), [plot-3-2.jpg](#)

Case 3-3:

Related files: [points-3-3.txt](#), PEEI-mem-3-3.bin, [cond-3-3.txt](#), [PEEI-sol-3-3.txt](#), [plot-3-3.jpg](#)

Case 3-4:

Related files: [points-3-4.txt](#), PEEI-mem-3-4.bin, [cond-3-4.txt](#), [PEEI-sol-3-4.txt](#), [plot-3-4.jpg](#)

Case 4-1:

Related files: [points-4-1.txt](#), PEEI-mem-4-1.bin, [cond-4-1.txt](#), [PEEI-sol-4-1.txt](#), [plot-4-1.jpg](#)

Case 4-2:

Related files: [points-4-2.txt](#), PEEI-mem-4-2.bin, [cond-4-2.txt](#), [PEEI-sol-4-2.txt](#), [plot-4-2.jpg](#)

Case 4-3:

Related files: [points-4-3.txt](#), PEEI-mem-4-3.bin, [cond-4-3.txt](#), [PEEI-sol-4-3.txt](#), [plot-4-3.jpg](#)

Case 4-4:

Related files: [points-4-4.txt](#), PEEI-mem-4-4.bin, [cond-4-4.txt](#), [PEEI-sol-4-4.txt](#), [plot-4-4.jpg](#)