Mechanics and Machines, HW CAE STR 2

Non-stationary Heat Transfer Problem

Innopolis University

Short Task Description

Description: Solve the non-stationary heat transfer equation using 2 methods:

1. Implicit Finite Difference Method
2. NX simulation

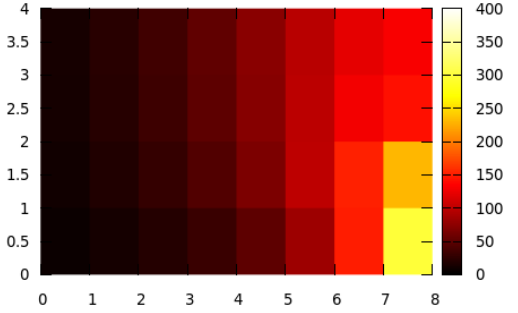
Research Object: Rectangular plate of size 7*6 cm. The initial value of the plate temperature is 10°.
Boundary conditions:

- the lower half of the left boundary is heat isolated
- 20 degrees is maintained on the lower (south) boundary
- the rest of the boundary temperature is 800 degrees

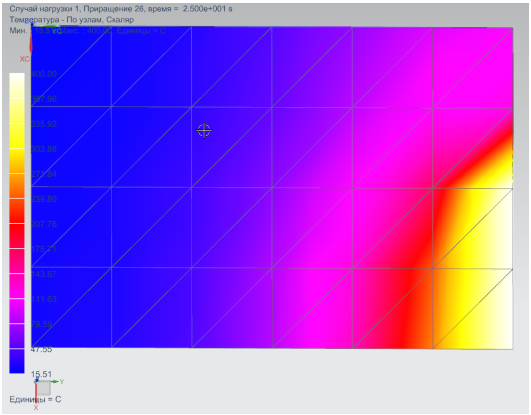
Simulation time: 10 sec
Artifacts:

- Zip archive with NX detail files (.prt) and simulation (.sim)
- Code, which can be executed anywhere
- 1-3 pages report in (.pdf). You should compare results from all 3 methods. It should contain formulas, explanation, considered assumptions and results.

Different case example



FDM result by coding



NX sim result

Deserve “A” grade!

– Oleg Bulichev

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Room 105 (Underground robotics lab)