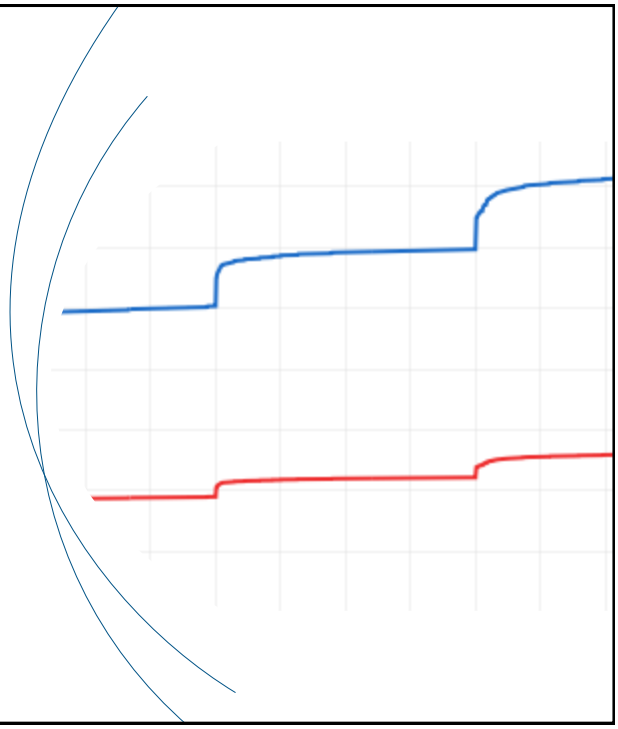
DASSAULT SYSTEMES

BETTER SIMULATION CODE FOR TFS IN DYMOLA

Dag Brück, dag.brueck@3ds.com



3DEXPERIENCE

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MOTIVATION

- Why is my simulation so slow?
  - Non-linear equation systems → many f-eval
  - Media calculations → many function calls
  - … and many other reasons
- Why is Dymola's code generation so ugly?
  - General solutions to handle unusual cases too
  - Traditionally more focus on equations
  - Ugly does not (always) mean slow
- Yes, there is room for improvements
  - Declare as constant/parameter when possible
- Functions in Dymola 2025x
  - Provably redundant checks removed
  - More efficient handling of arrays, some common cases handled in a more efficient way
  - Better identification of constant expressions
  - Package constants
- Credits due
  - Hans Olsson, DS Lund, Sweden

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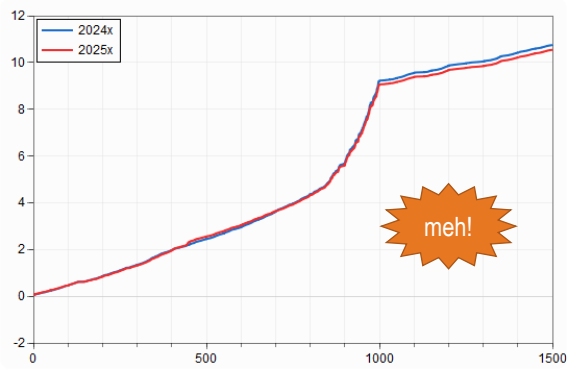
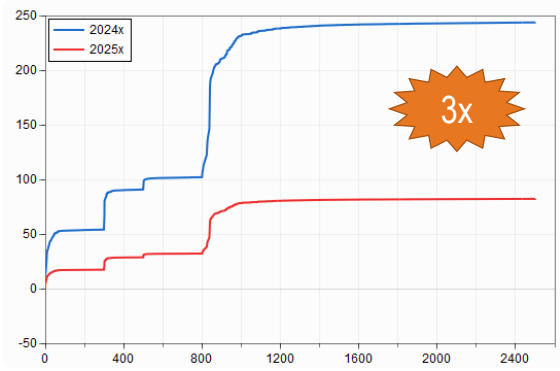
PERFORMANCE RESULTS

Total CPU time, Evaluate=true, WSL gcc –O1 –march=native



Espresso Machine



Heat Pump

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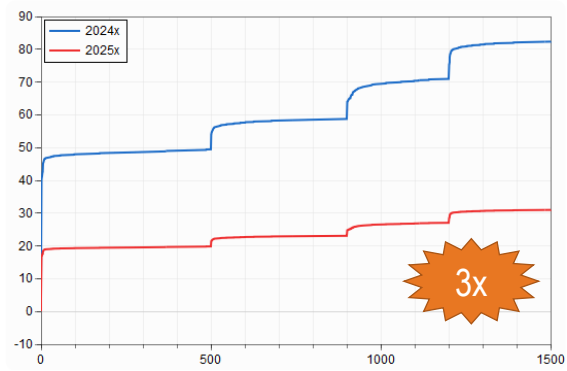
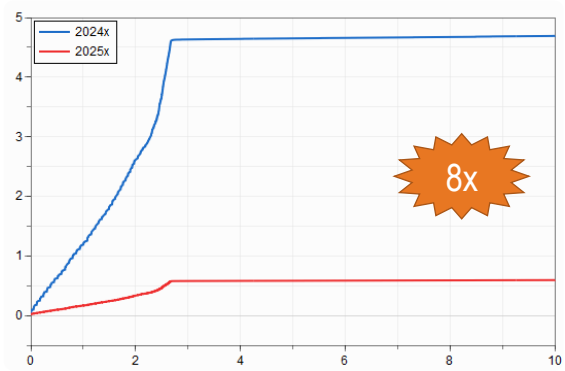
PERFORMANCE RESULTS

Total CPU time, Evaluate=true, WSL gcc –O1 –march=native



Vapor Cycle



Clucking Bottle

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