Purposes to use cooling vest

- To reduce thermal stress
- To increase performance
- To possibly create comfort

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Phase Change Material (PCM)

- Salt (TST vest)
  - Melting temperature: 28 ^{o}C

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Measurement methods

- **Thermal manikin in climatic chamber**
  - T-shirt, shorts
  - TST Vest
  - RB90 underwear
  - RB90 jacket and trousers
  - Manikin and air temperature: 38 ^{o}C

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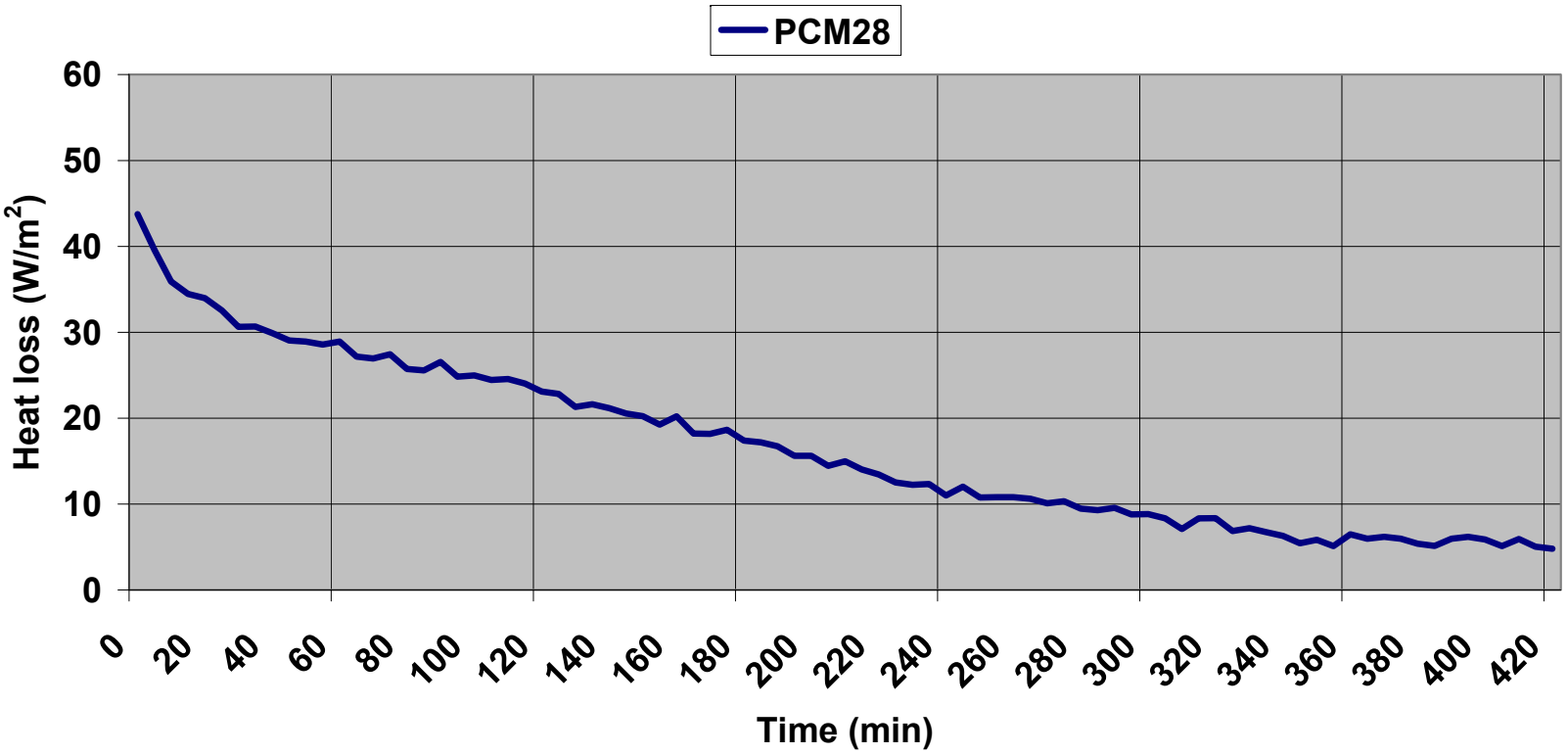
Measurement methods

- **Human subjects**
  - T-shirt, shorts
  - TST Vest
  - RB90 underwear
  - RB90 jacket and trousers
- 20 min cycling (T_a=20 ^oC)
- 30 min walking on treadmill
  (5 km/tim)
- T_a=55 ^oC, RH=30%

Result: on manikin (38 ºC)

$T_a=T_{manikin}=38\ ^{o}C$, $V_a=0.4$ m/s, T-shirt, TST vest, RB90 UW+OW



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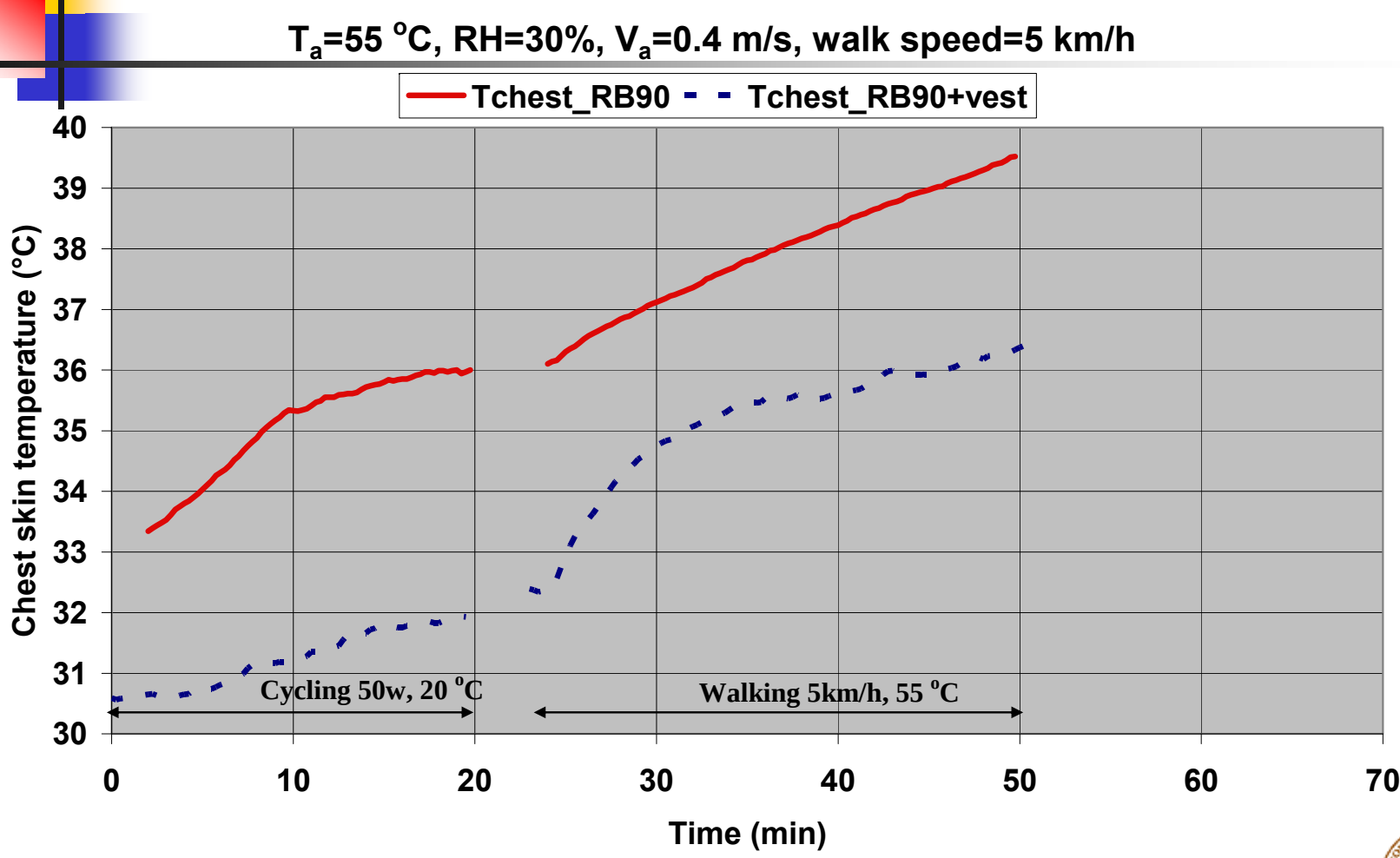
Result: Chest temperature on subject 1



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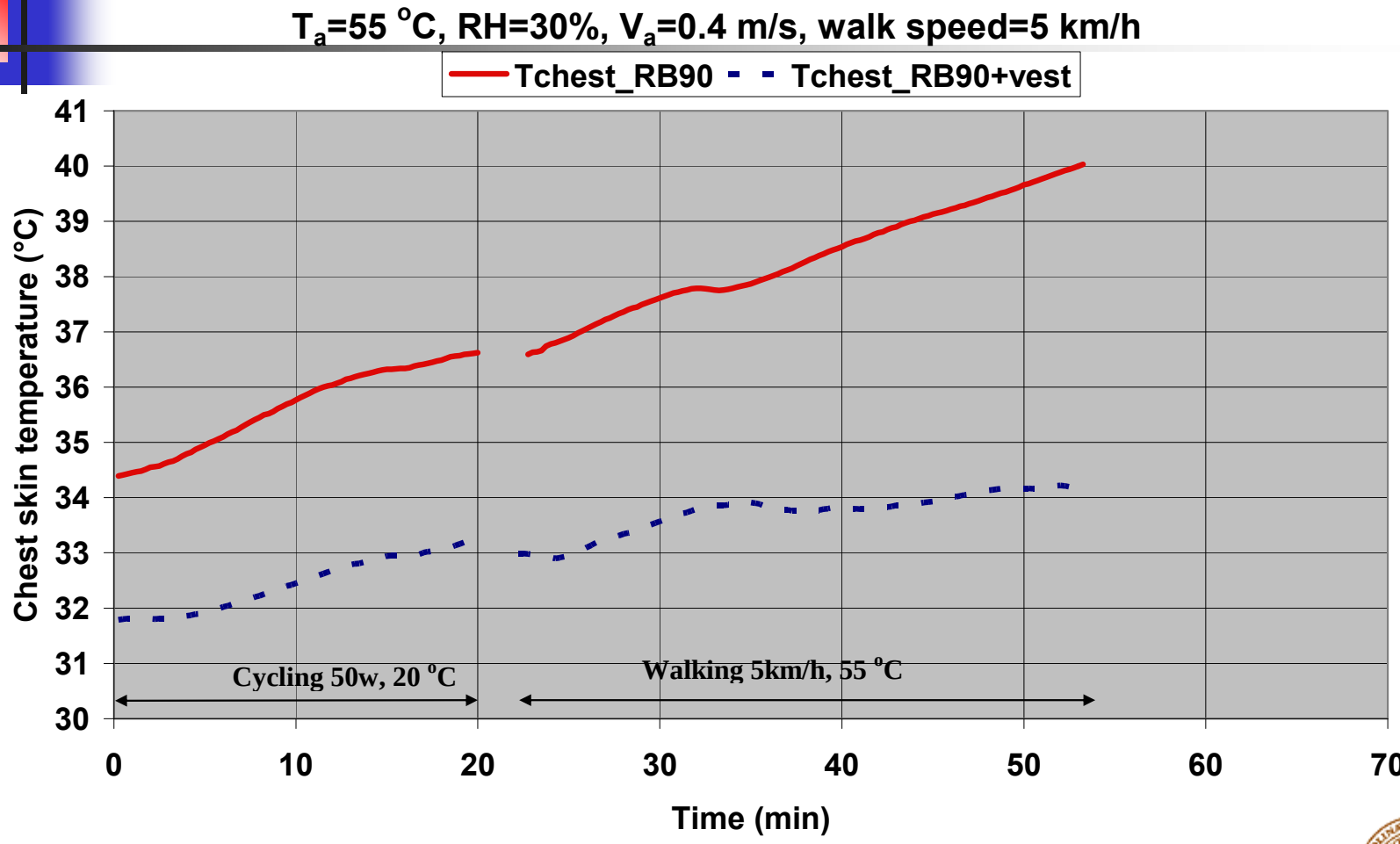
Result: Chest temperature on subject 2



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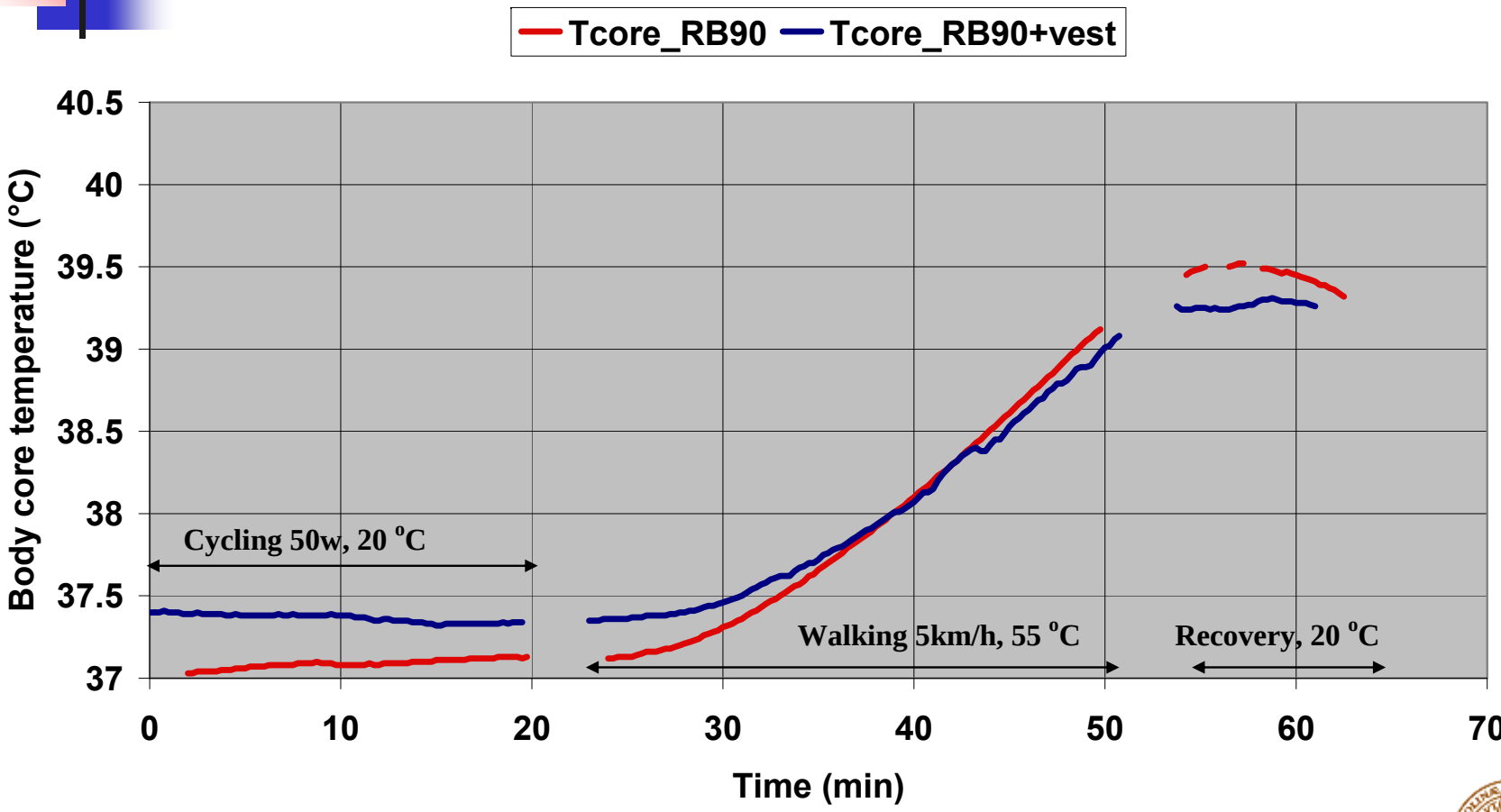
Result: Body core temperature on subject 1

T_a=55 °C, RH=30%, V_a=0.4m/s, walk=5 km/h



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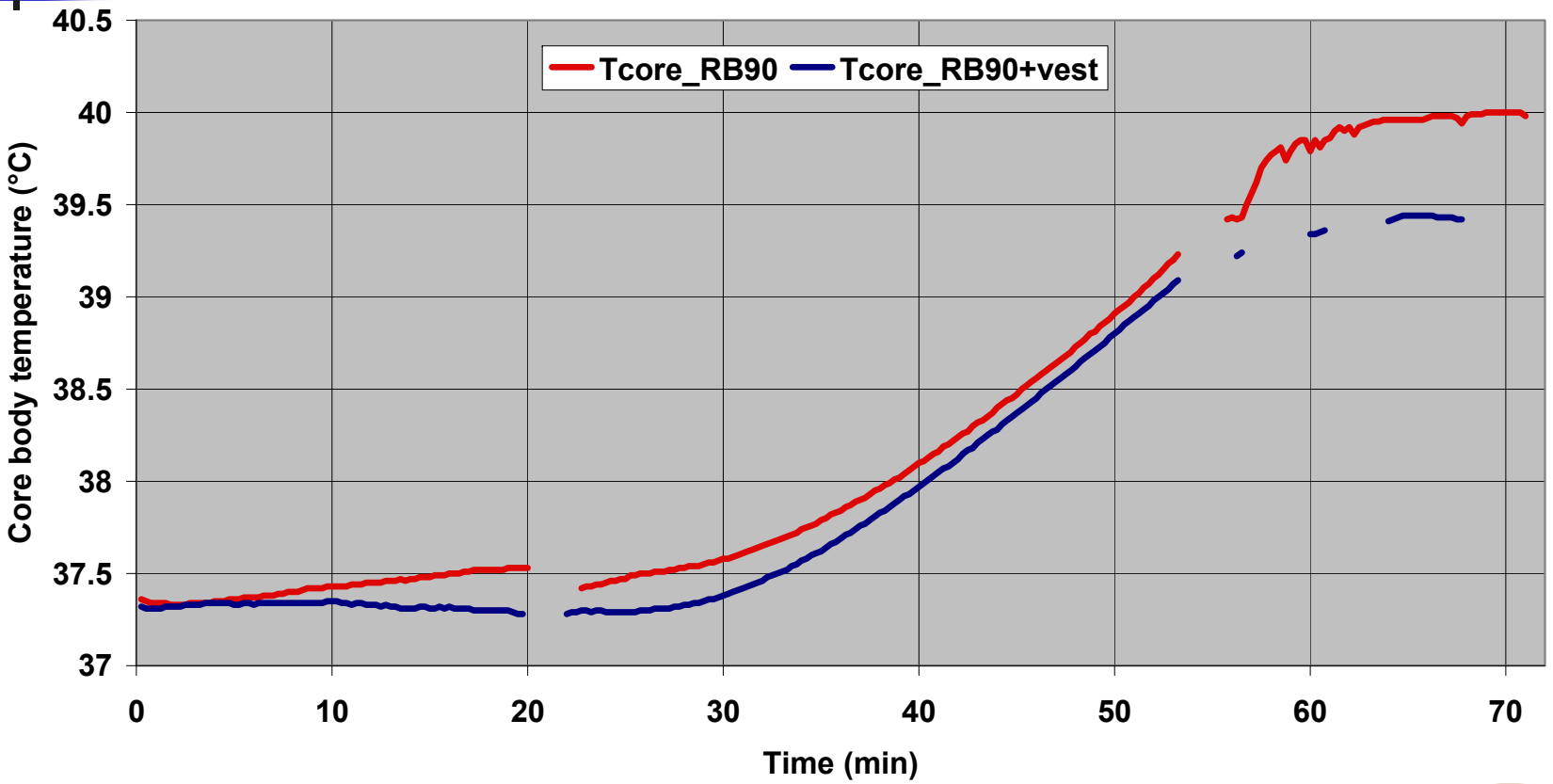
Result: Body core temperature on subject 2

T_a=55 °C, RH=30%, V_a=0.4 m/s, walking speed=5 km/h



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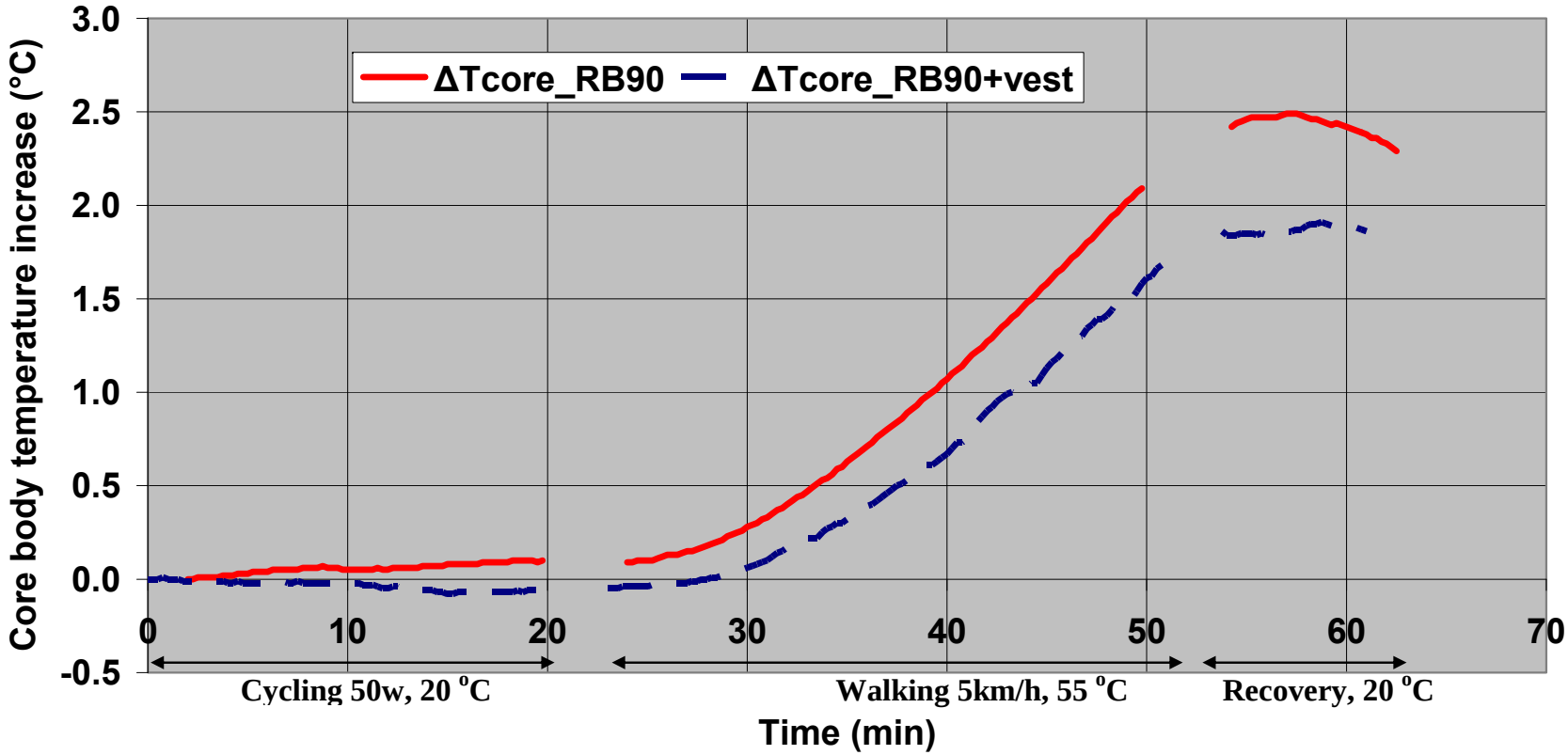
Result: Change in body core temperature on subject 1

T_a=55 °C, RH=30%, V_a=0.4 m/s, walking speed=5 km/h



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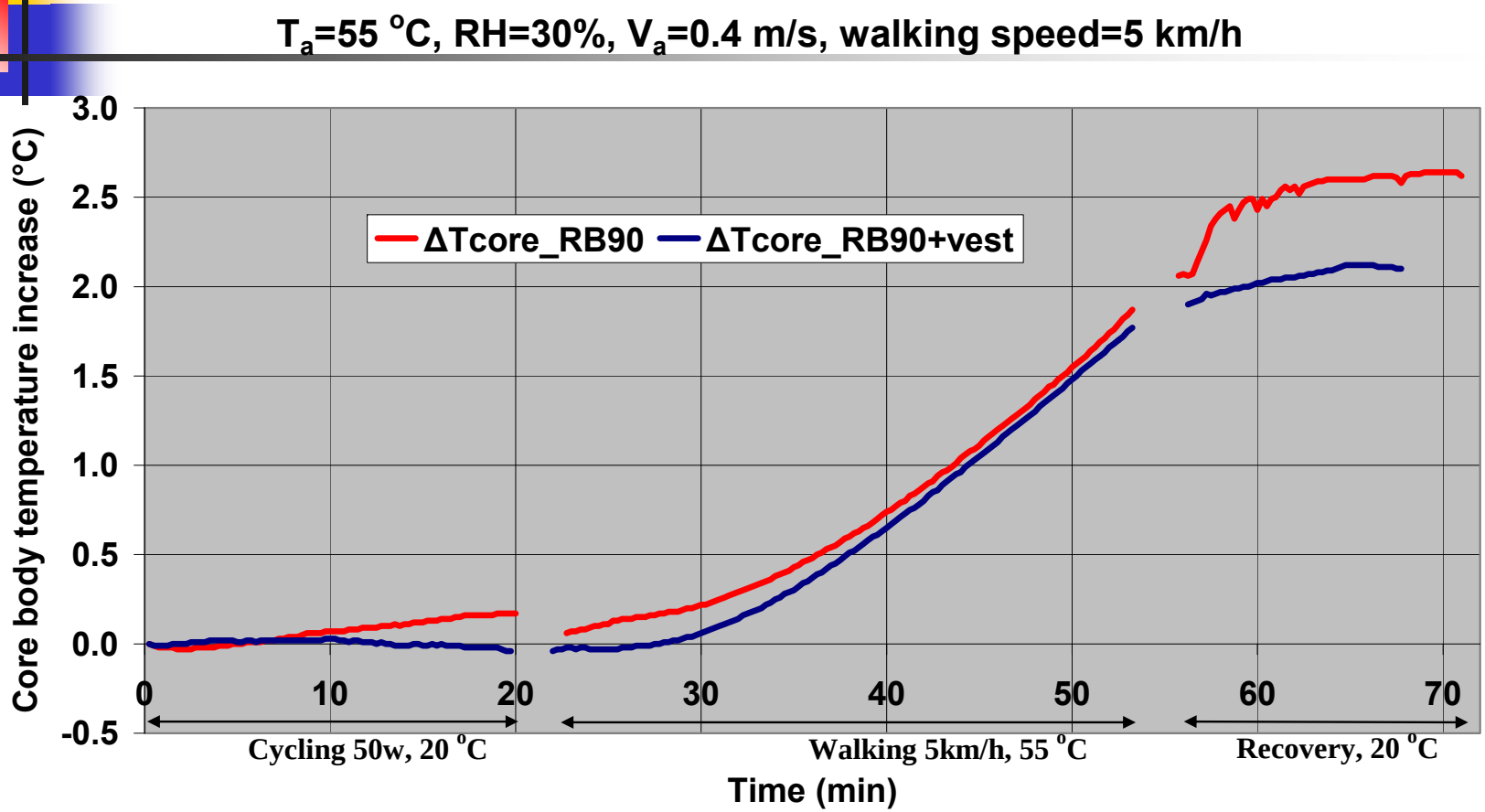
Result: Change in body core temperature on subject 2



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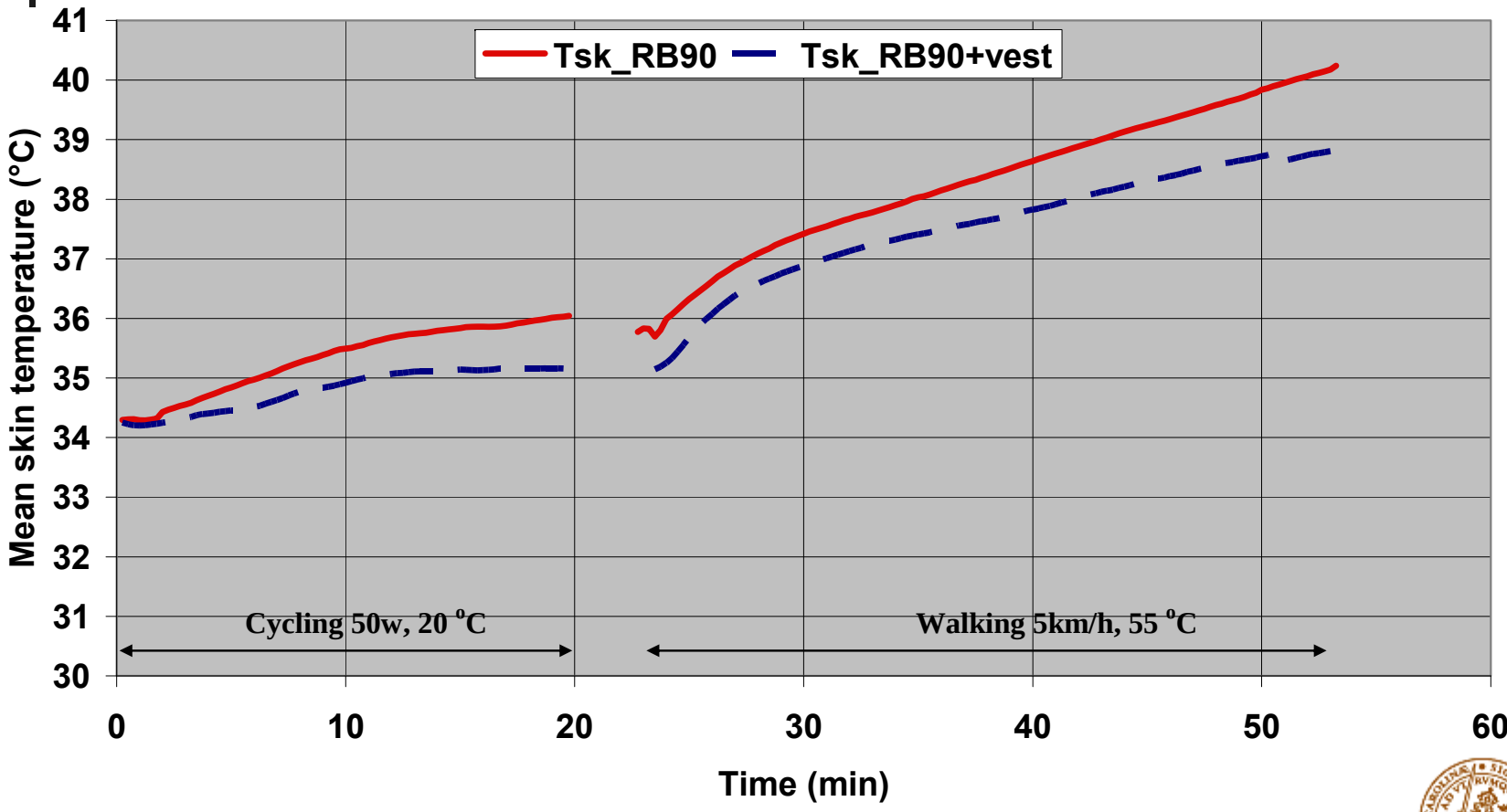
Result: Average of two test persons in mean skin temperature

T_a=55 °C, RH=30%, V_a=0.4 m/s, walk speed=5 km/h



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