

Mini stave FEA

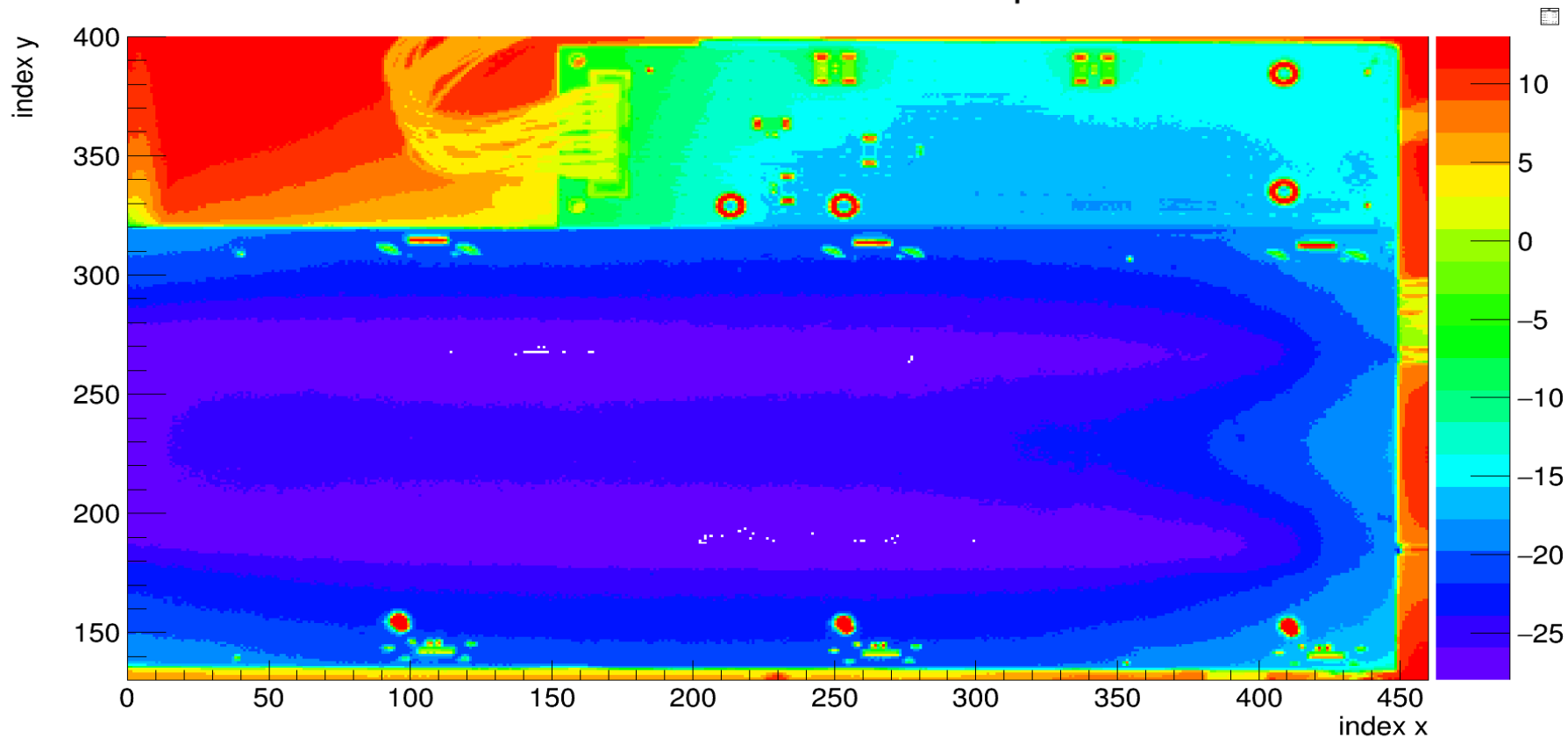
Shuaiyan

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Update

- Take measurement using small angle lens, pixel length~0.6 mm
- Chiller set Temperature -40 C, bypass inlet -33.3 C, outlet -31.0 C
- Powered resistors: LHSM R4//R5 , R6//R7 : ~0.333W each ; R3: ~0.171W
- Add holes on PCB in FEA model, element size~0.6 mm
- Data taken with little air flow

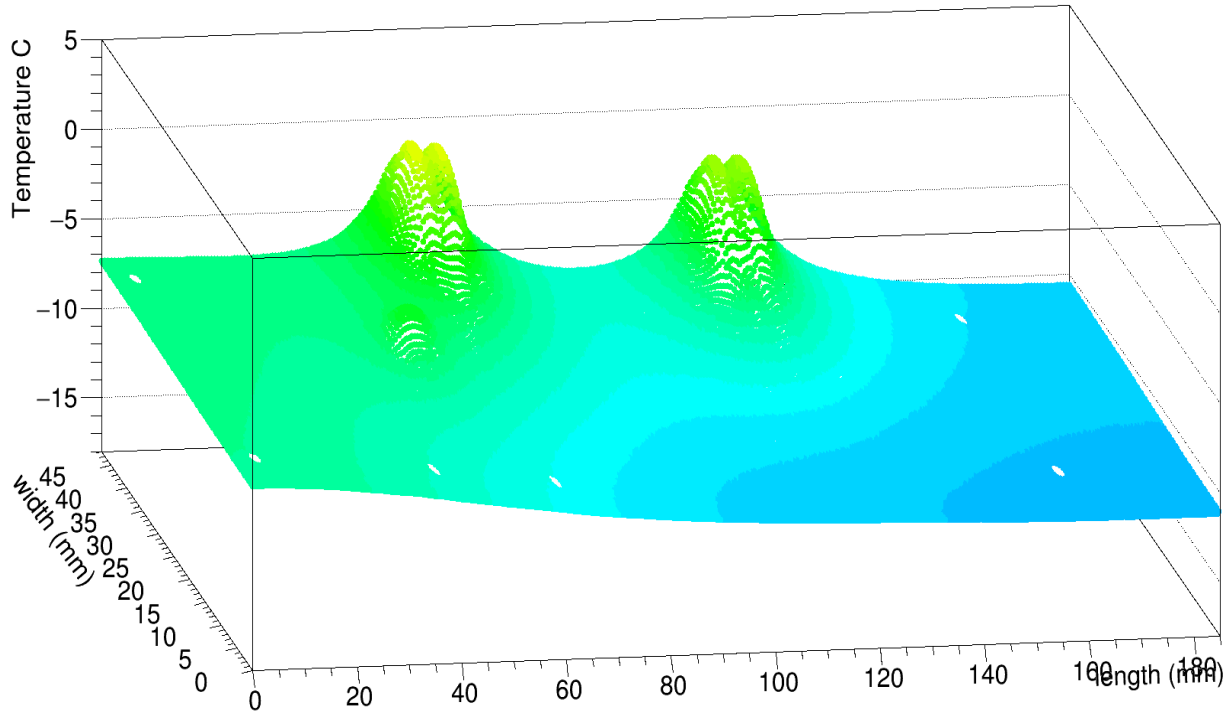
Measured ministave surface Temperature



Small dots in plot correspond to tiny PCB holes, diameter~0.3 mm

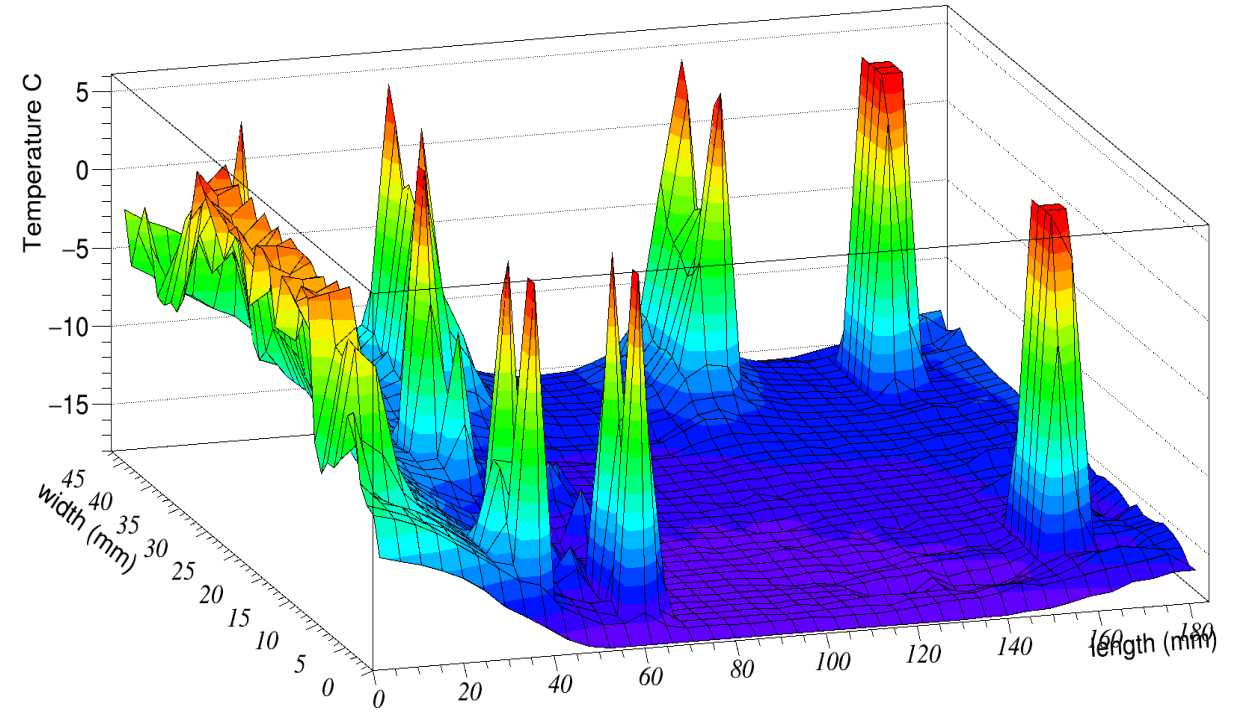
PCB region

Simulated PCB surface Temperature



Model set PCB all glued to EOS

PCB measured surface Temperature

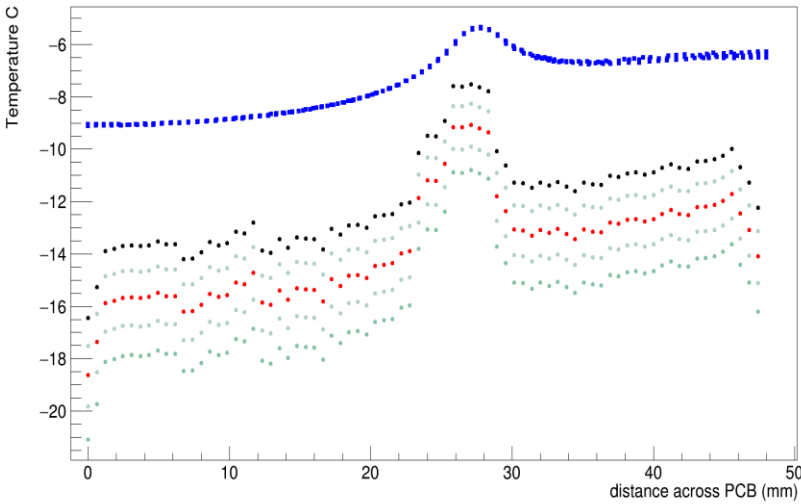


Some peaks due to low emissivity of PCB holes and soldering points
PCB is partially glued to EOS

Temperature across PCB for different emissivity

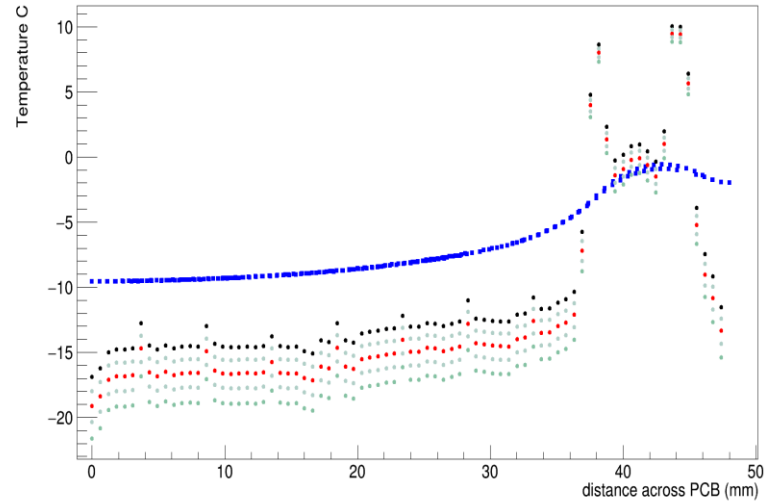
- Emissivity: black curve 0.96; red 0.92; deep green 0.88.
- FEA simulation: blue curve

Temperature across PCB



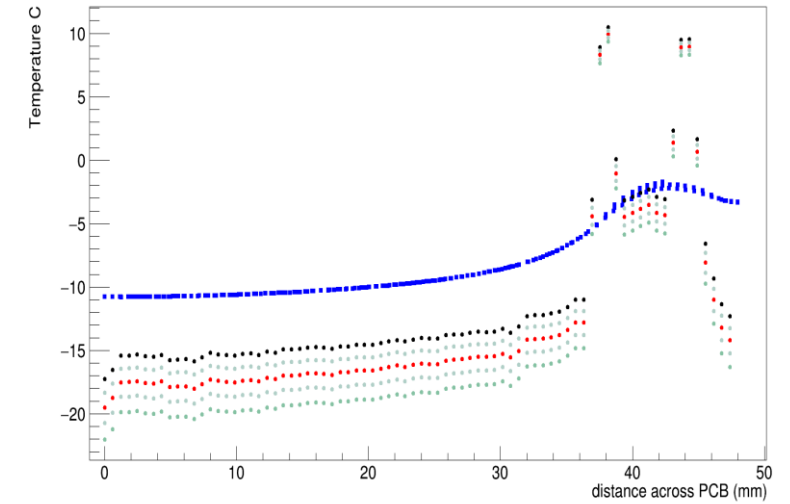
At length~46mm, passes R3

Temperature across PCB

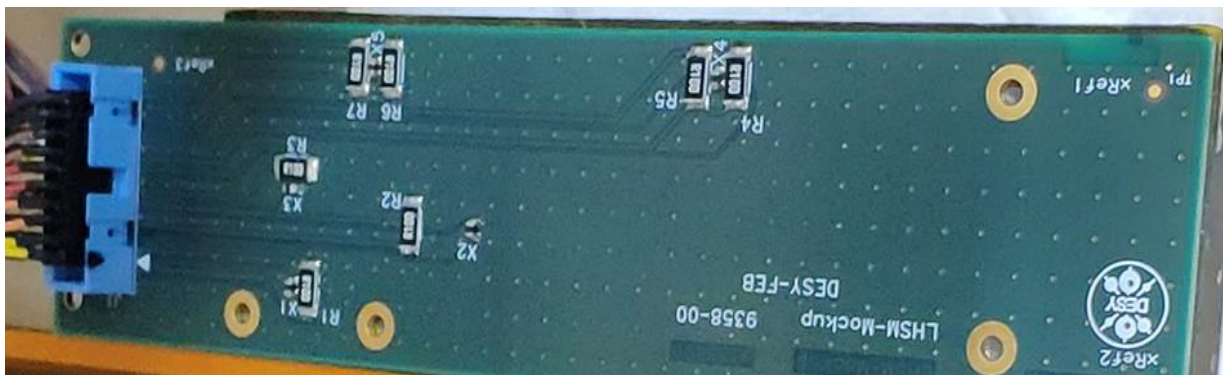


At length~57mm, passes R7

Temperature across PCB



At length~115mm, passes R5



Stave ambient contact may not be modeled accurately

Next:

- Modify model contact regions
- Power resistors on both sides
- Test with different cooling temperature