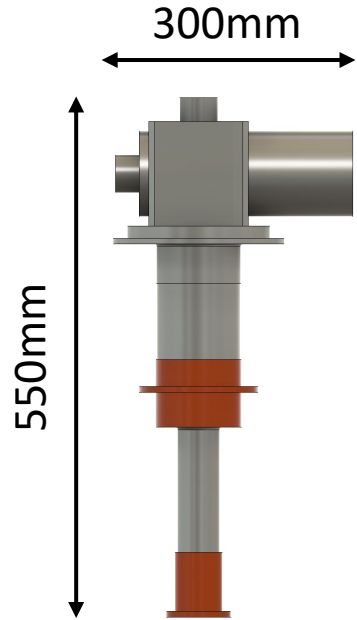
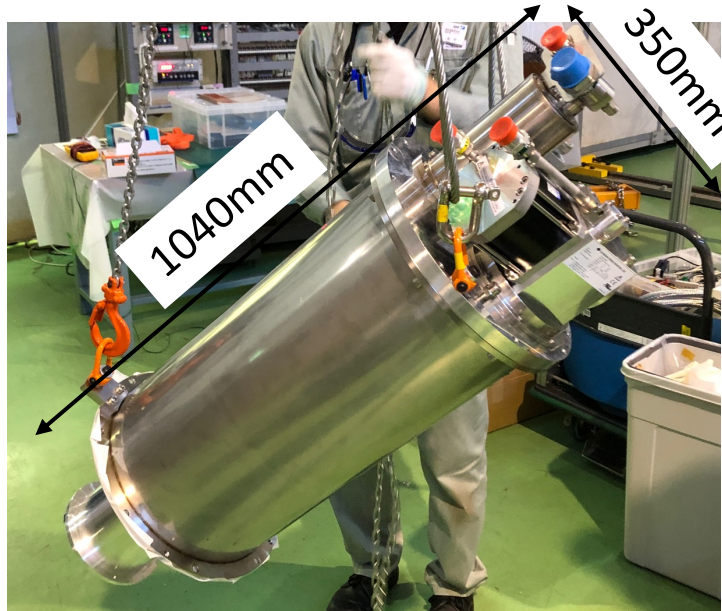
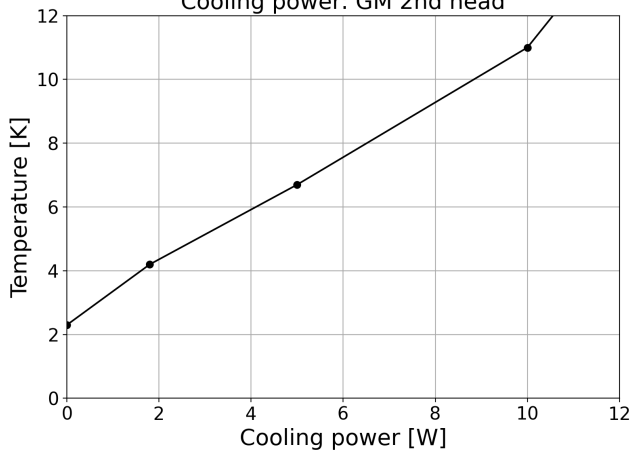


# GM and GM-JT cryocoolers



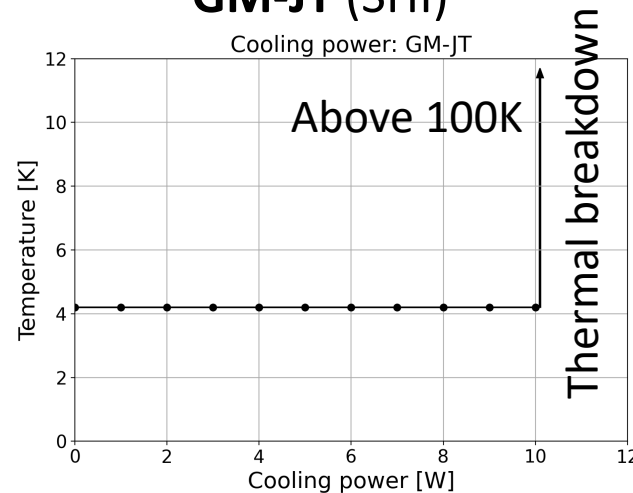
**GM: RDE-418D4 (SHI)**

Cooling power: GM 2nd head

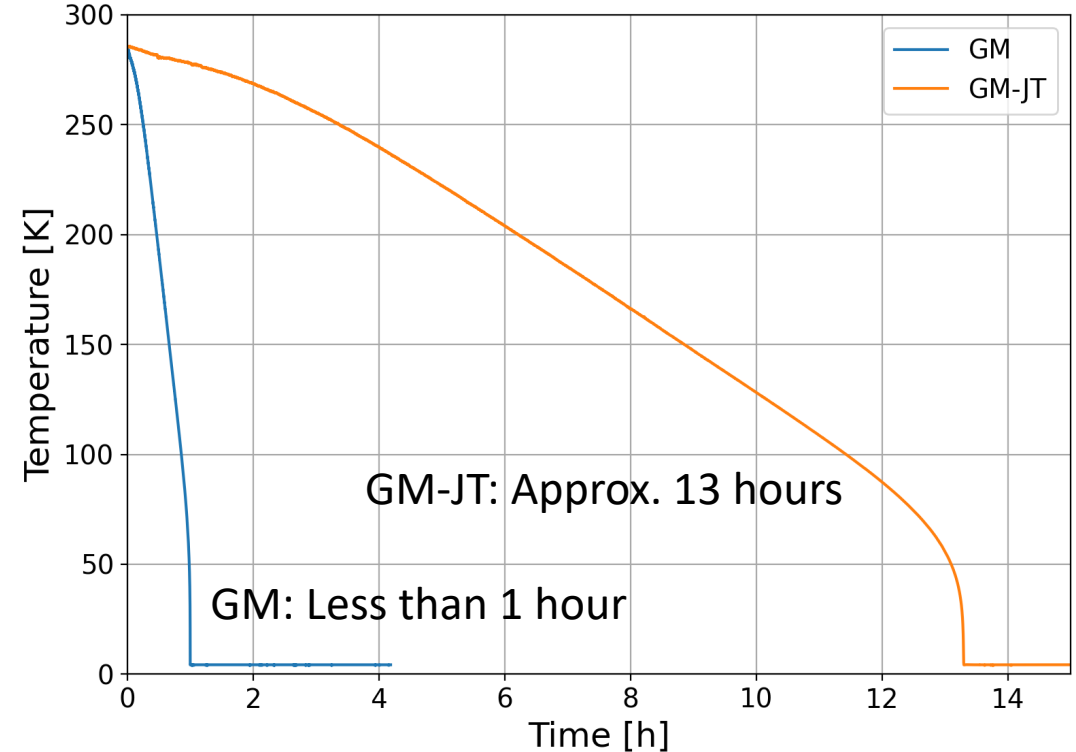


**GM-JT (SHI)**

Cooling power: GM-JT



Cooling time w/o cold mass

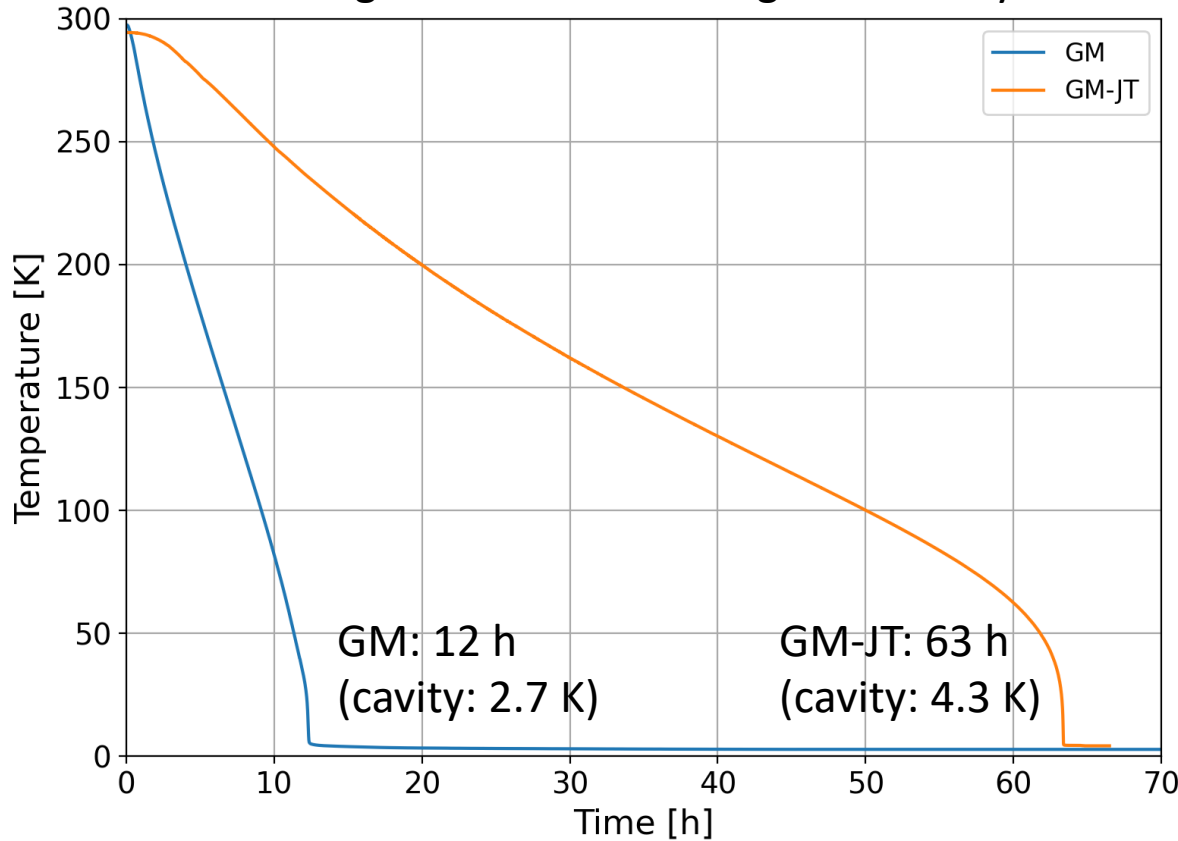


- The GM doesn't have thermal breakdown, whereas the GM-JT will be thermally broken above allowable heat input (9-10W).
- The GM-JT takes long cooling time because of its poor cooling capacity in high temperature region.

# Cavity cooling (1.3GHz)

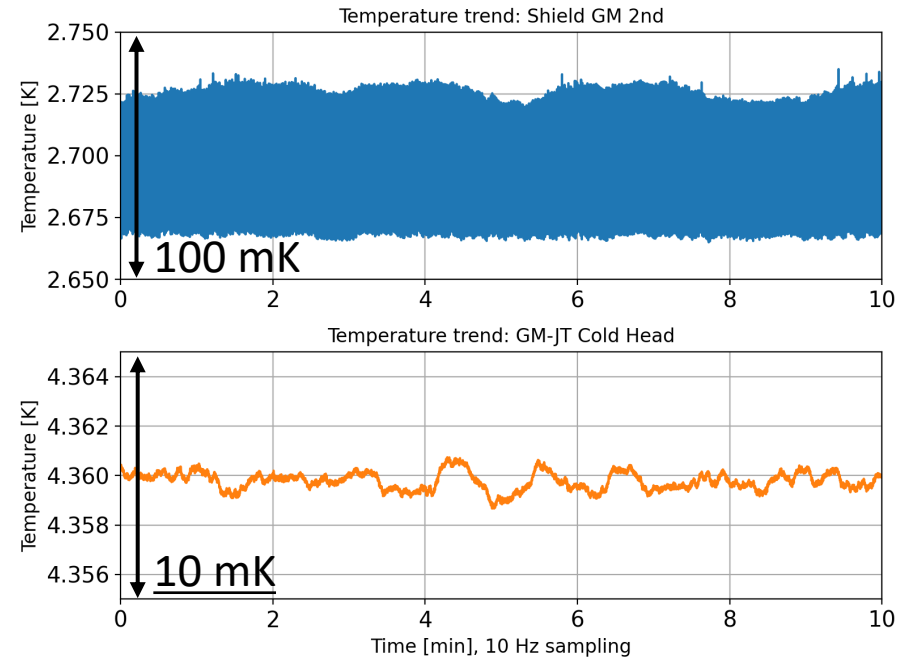


### Cooling time of 1.3 GHz single cell cavity



- GM-JT takes almost 5 times long time to cool down the cavity.
- Minimum temperatures for cases of GM and GM-JT were 2.7 K and 4.3 K, respectively.

### Cold heads' temperature oscillation



GM-JT temperatures were quite stable.

- We saw several hundreds Hz of frequency fluctuation in the GM case. <- Due to vibration or temperature?
- Considering thermal resistance in the thermal link and RF heating at the cavity, the cold head temperature needs to be as low as possible to keep the cavity temperature near 4.2K.