

# Update on Stripline Feedthrough Prototype

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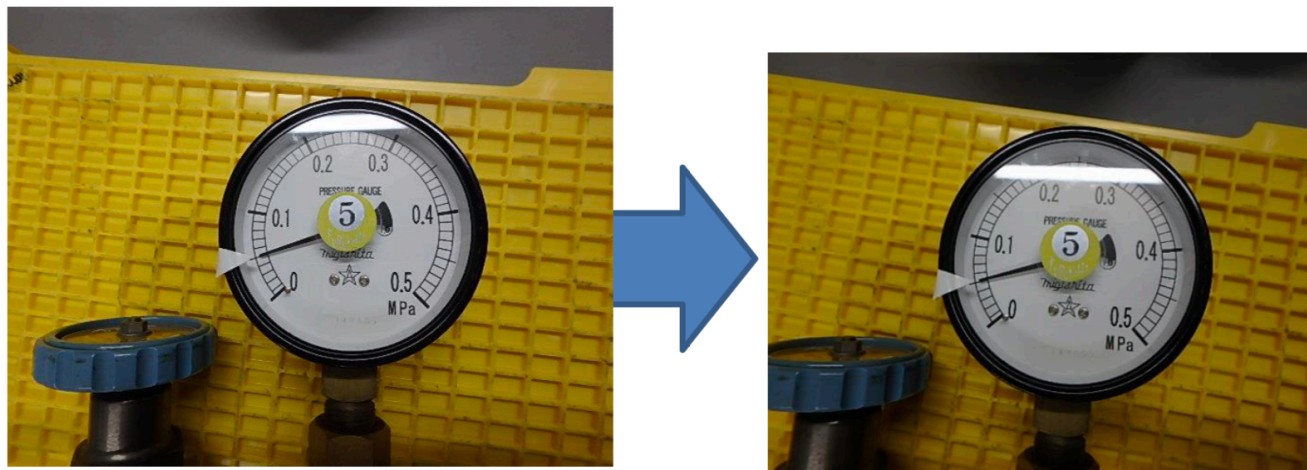




- Long-term pressure test of modified prototype
- Thought on current-testing prototype

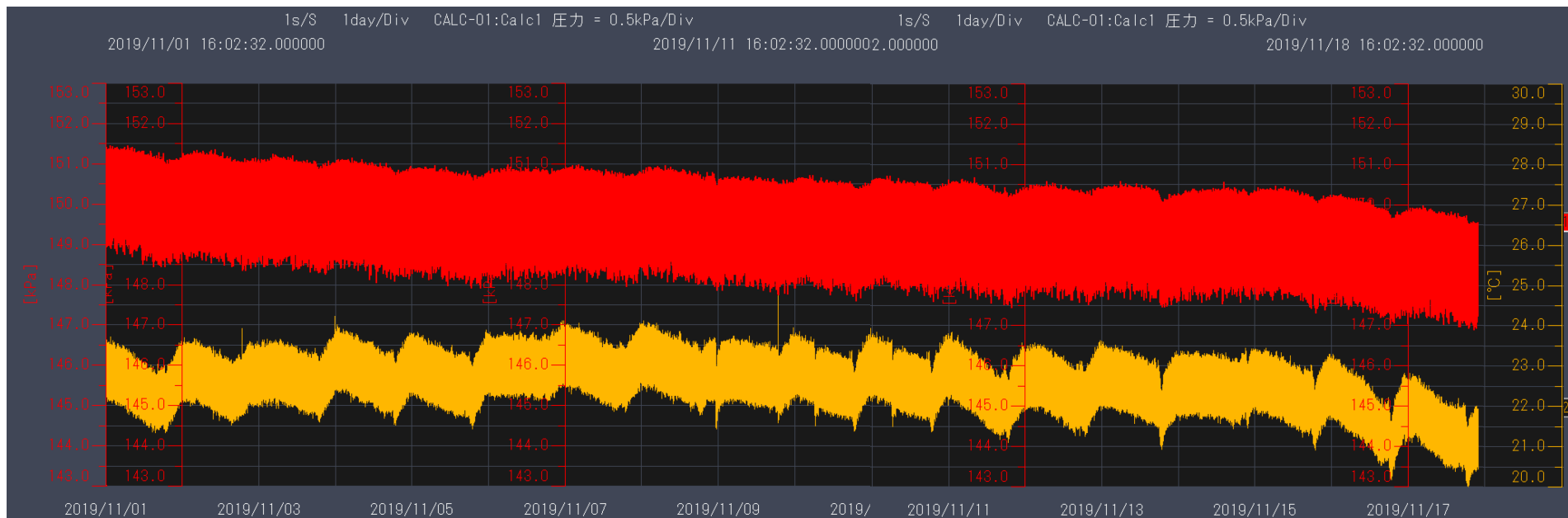
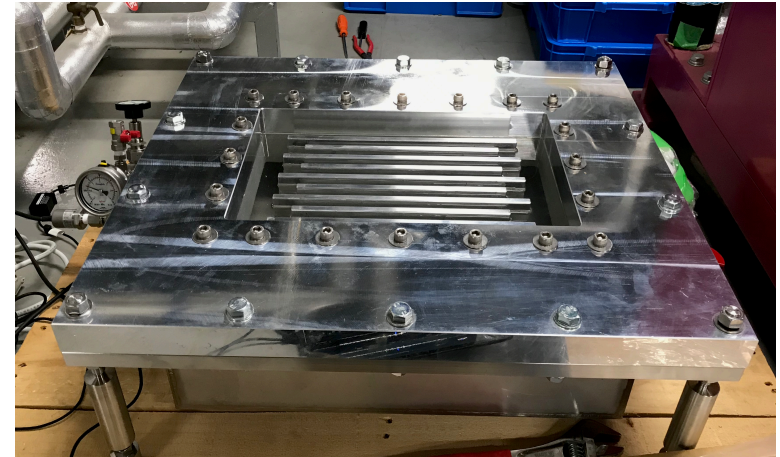
# Pressure Test

- Pressure test at company
  - 0.05 MPa gauge N<sub>2</sub> pressure applied for 1 hour
  - No pressure drop observed

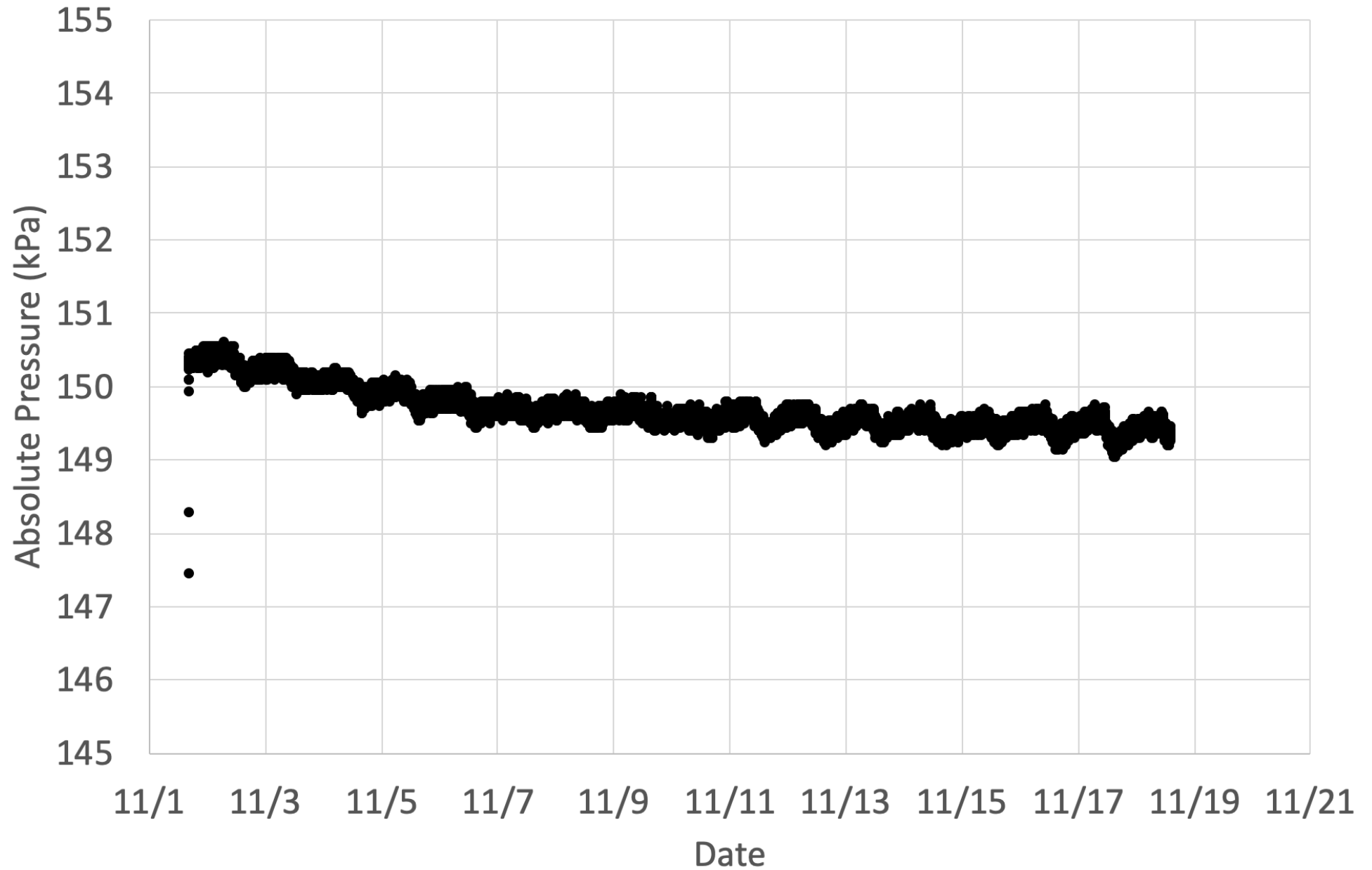


# Further Pressure Test

- The prototype delivered to J-PARC at the end of October
- Longer-term pressure test performed for 17 days
  - Started on 11/5 at 16:00 150.35 kPa
  - Finished on 11/22 at 14:00 149.36 kPa
  - 0.99 kPa decreased within 405 hours
  - Test volume = 9.5 L (0.0095 m<sup>3</sup>)
- Leak rate =  $6.45 \times 10^{-5}$  Pa·m<sup>3</sup>/s
  - Great improvement from previous result ( $1.83 \times 10^{-2}$  Pa·m<sup>3</sup>/s)
  - Specification :  $10^{-6}$  ⇒ Is this result still acceptable?

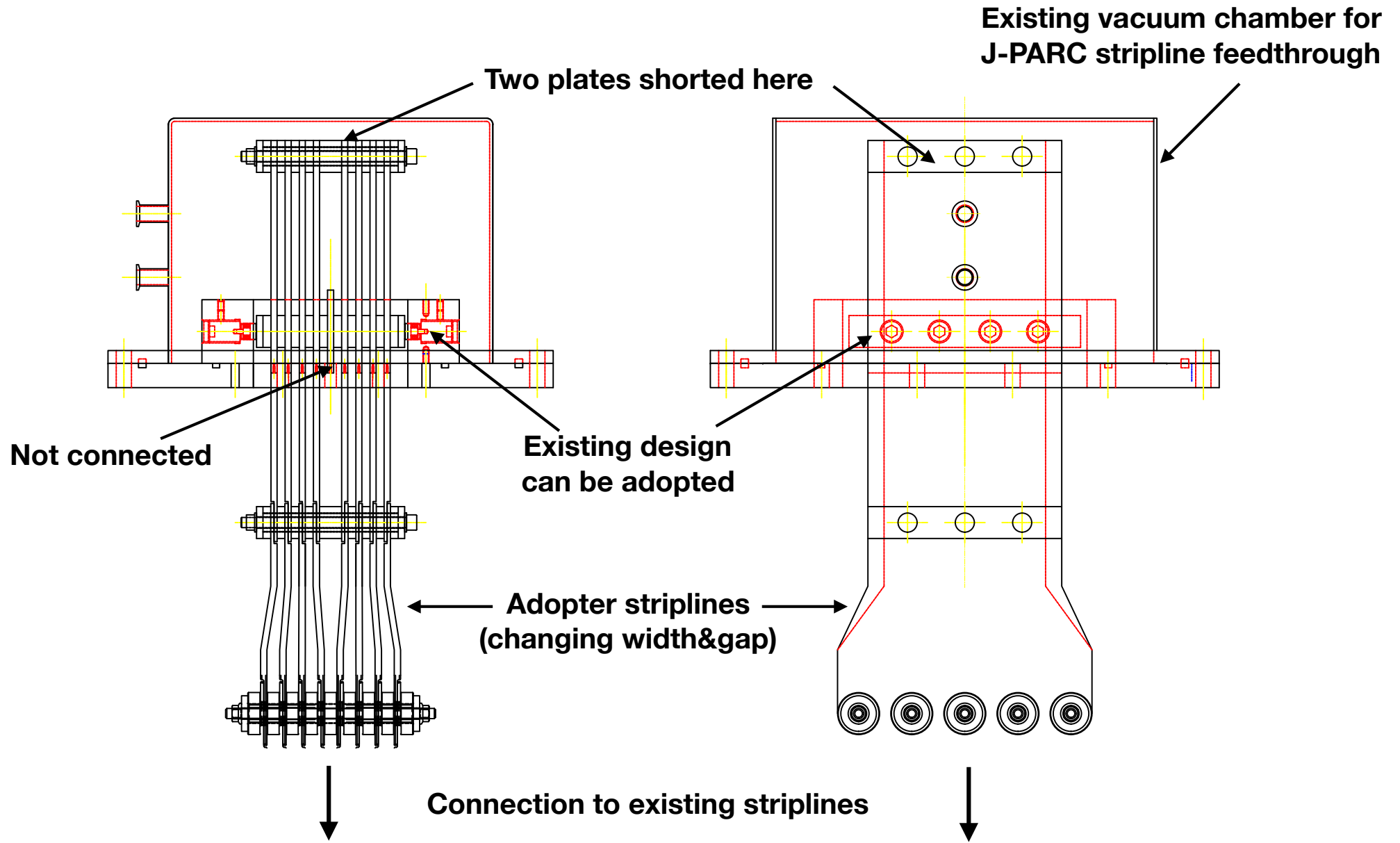


# Pressure Corrected by Temperature





- Overview
  - Long-term pulsed current will be applied to current-testing stripline prototype
  - To check vibration tolerance in terms of sealing performance
- How to perform?
  - 9-conductor configuration (LBNF)  $\Leftrightarrow$  8-conductor configuration (J-PARC)
  - Difficulty in connecting 9 and 8 conductors  $\Rightarrow$  8 conductors OK?
  - If so, what current should be applied?
    - 300kA?  $\leftarrow$  design current
      - If 300 kA applied to 8 conductors, Lorentz force is much stronger than 9 conductors  $\Rightarrow$  Current fixing structure may not be enough strong
    - Lorentz force = 3kN/m ?  $\leftarrow$  expected force on striplines?
      - Current sealing design can be directly applied





- **Parts production and assembly** : Within JFY2019
  - Pressure test at manufacturing company
- **Preparation for current testing** : April in JFY2020
  - Including longer-term (~2 weeks) pressure test at J-PARC
- **Current testing** : May in JFY2020
  - Measurement items
    - Current, voltage, pulse width
    - Vibration and acceleration around sealing structure (without vacuum chamber)
    - Pressure monitoring with 0.5MPaG during continuous operation
      - Short-term : several hours
      - Long-term : 1~2 week