

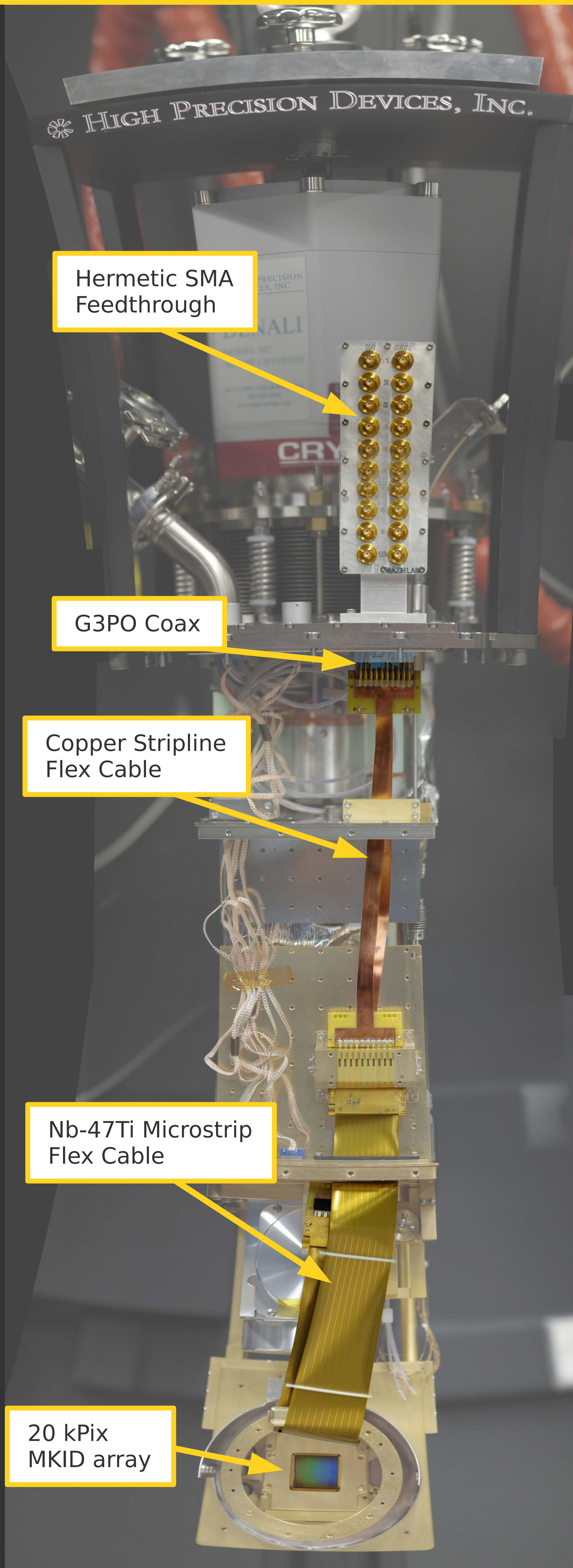


Flexible Cryogenic Microwave Wiring for the MKID Exoplanet Camera (MEC)

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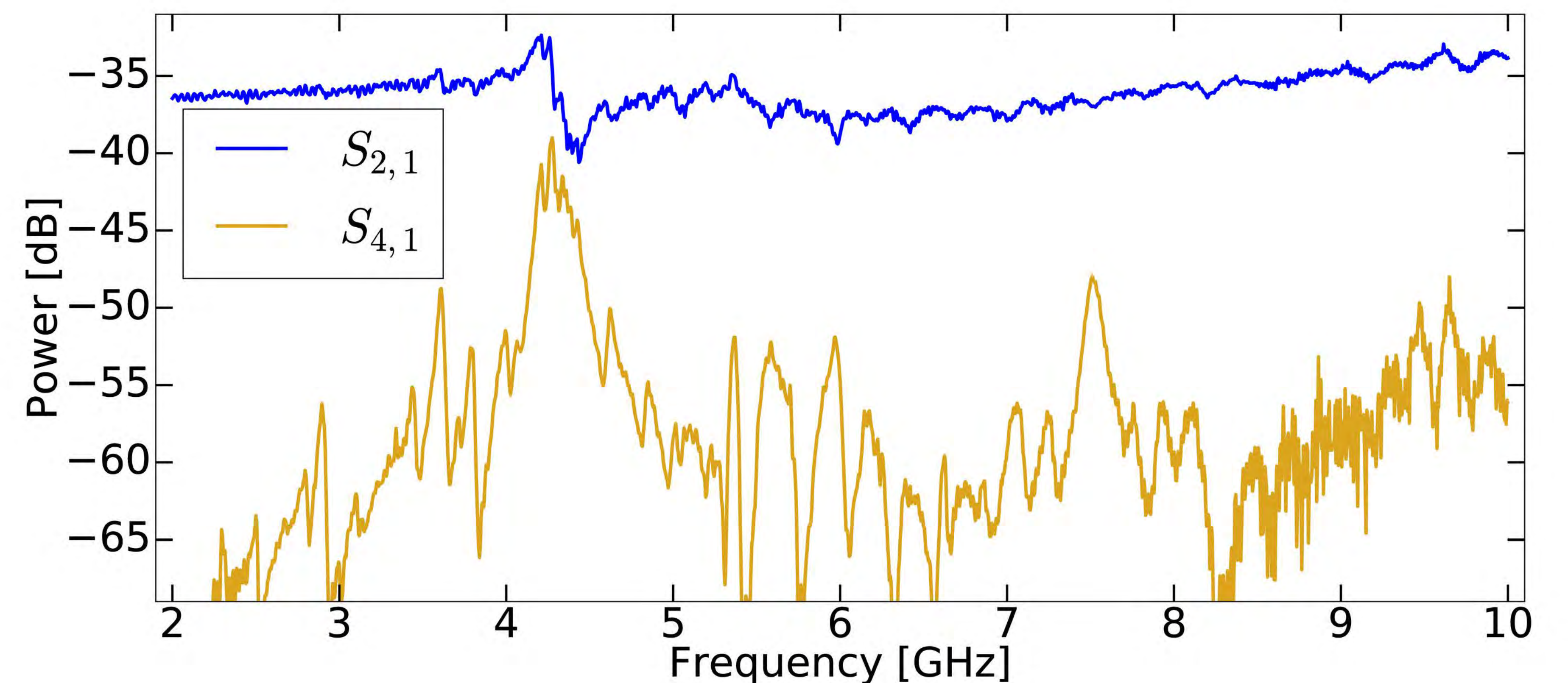
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ABSTRACT: We present the microwave and thermal properties of custom made flexible cryogenic microwave cabling for the MKID Exoplanet Camera (MEC) on the Subaru Telescope. MEC cools a 20,000 pixel MKID array to 100 mK and requires 10 microwave feedlines (20 connections) with signals from 4--8 GHz. Between 300 K and 4 K we use the Rogers Corp. LCP dielectric film Ultralam with 1/4 oz Cu cladding to make a 10 trace stripline flexible cable. The ends have G3PO push-on coax connectors. The input side has an integrated 30 dB Pi attenuator at the 4 K end. Between 4 K and 100 mK we use superconducting 53% Nb - 47% Ti alloy laminated onto DuPont's Kapton/epoxy dielectric film Nikaflex to make a 10 trace microstrip flexible cable. The ends are glued with silver epoxy to a copper transition board with G3PO connectors. Our newest design uses 10 micron thick Nb-47Ti and a 76 micron dielectric stackup.

Copper Stripline Flex:

- Ultralam 3850HT Dielectric
- Push-on G3PO Interconnects
- Integrated 30dB Attenuator
- **2.7 W-cm @ 4 K**
- 1 mm Pitch
- 25--38 cm Long



Nb-47Ti Microstrip Flex:

- Nikaflex Dielectric
- Push-on G3PO Interconnects
- Superconducting
- **0.07 μW-cm @ 0.1 K**
- 3.5 mm Pitch
- 22 cm Long

