Advances in Frequency Selective Surface Technology for Future Space Science Missions

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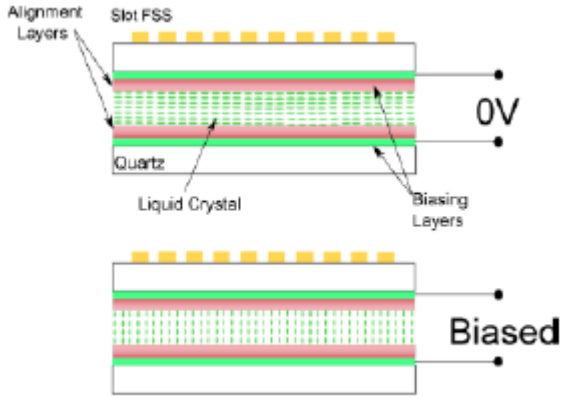
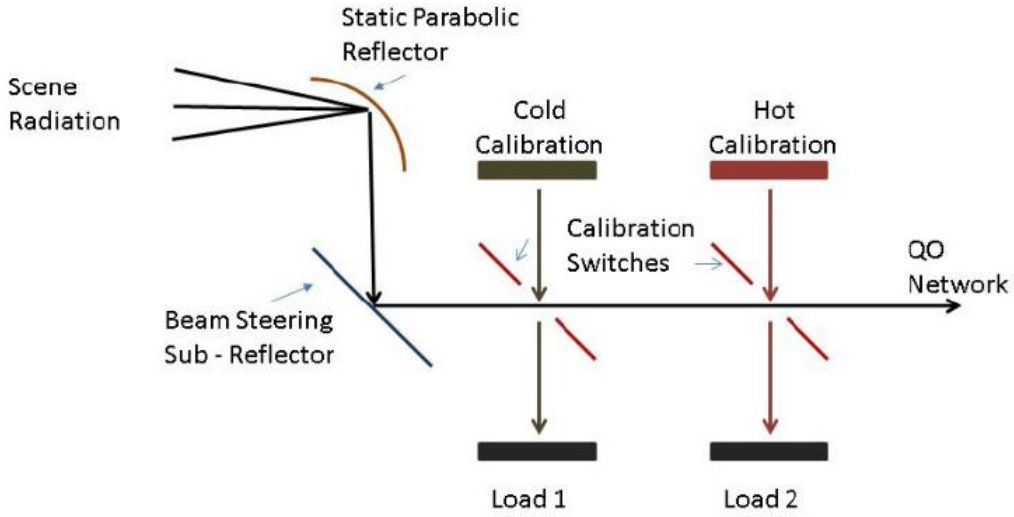
Reconfigurable Technology

CENTRE FOR WIRELESS INNOVATION

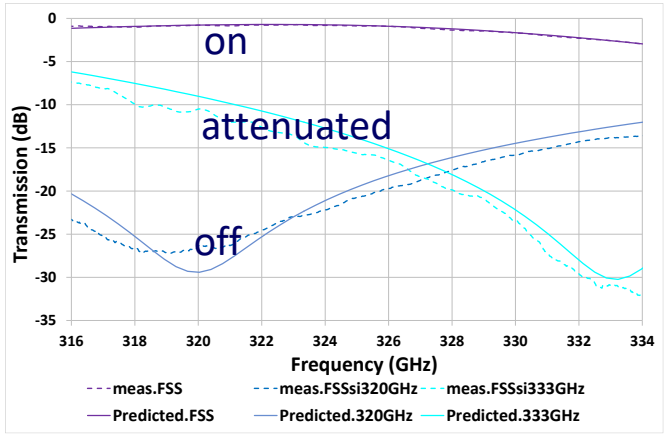
- New Electronic Switching Arrangement for mm-Wave Radiometer Calibration
- To provide a reduction in payload mass, footprint, power consumption and increase instrument reliability

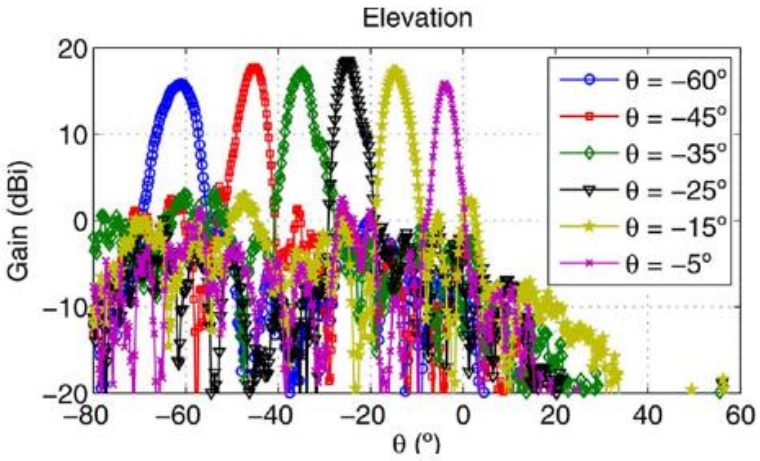


LC Reconfigurable Array

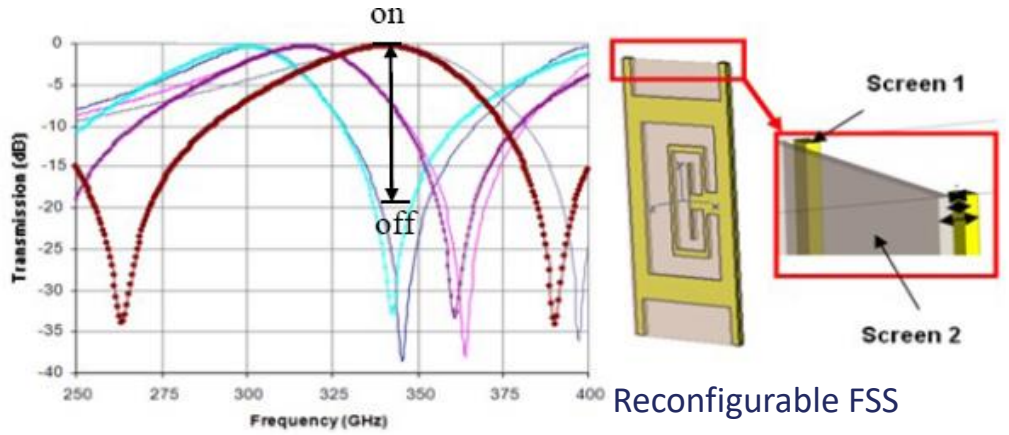


Transmission Measurements



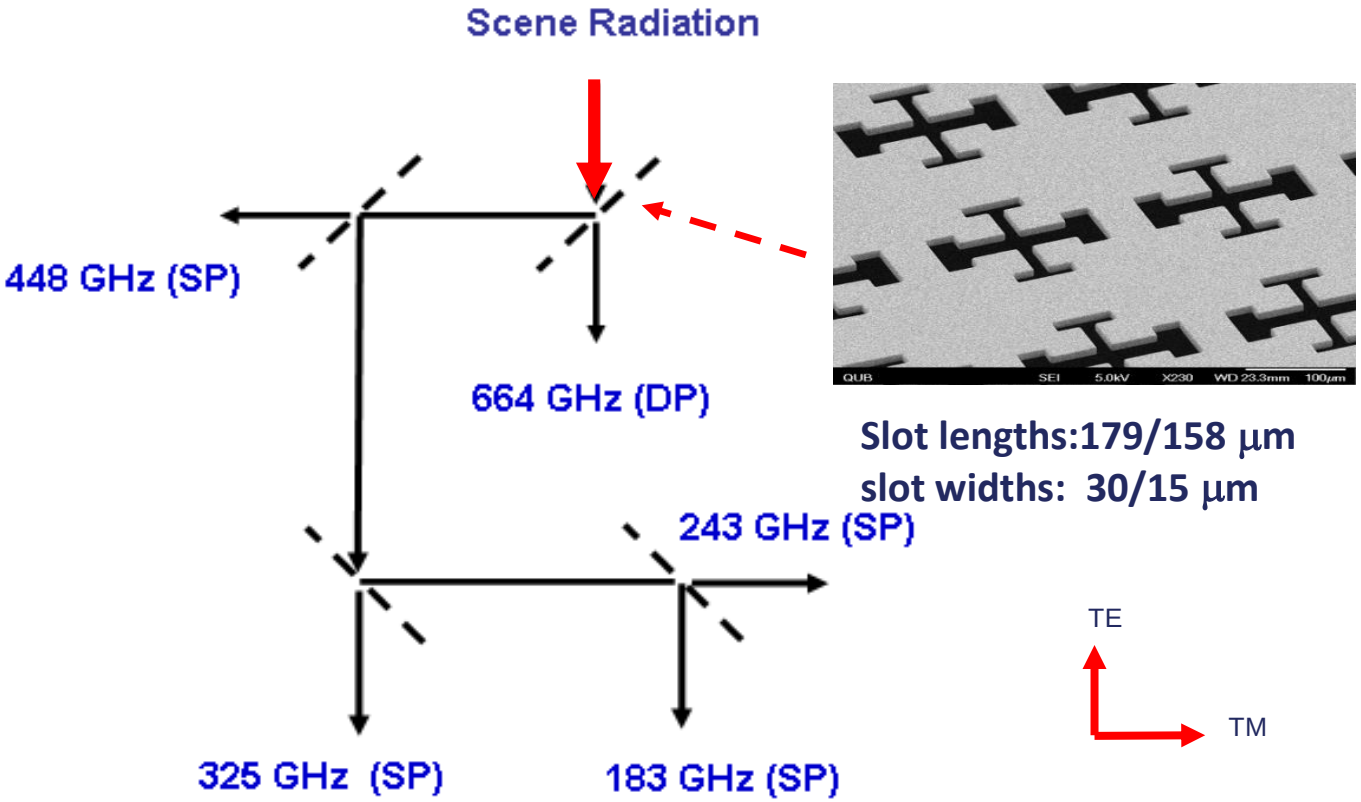


Measured elevation radiation patterns at several scan angles

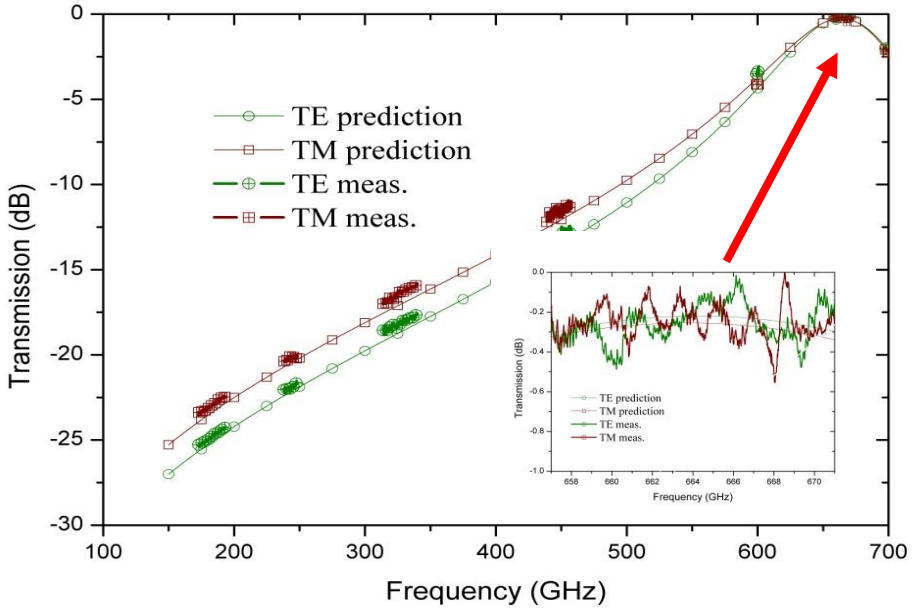


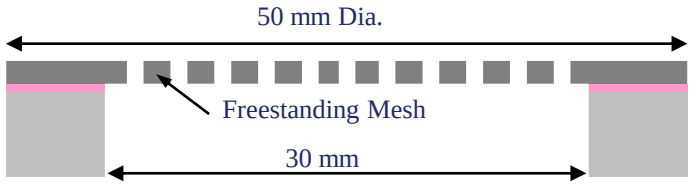
Reconfigurable FSS

Freestanding 664 GHz FSS



Slot lengths:179/158 µm
slot widths: 30/15 µm





The filter specification satisfies the requirement for the MWI and CIWSIR/GOMAS spaceborne missions to separate the 664 GHz channel from four frequency bands in the range 183 GHz – 448 GHz.

Freestanding Dual Polarisation FSS

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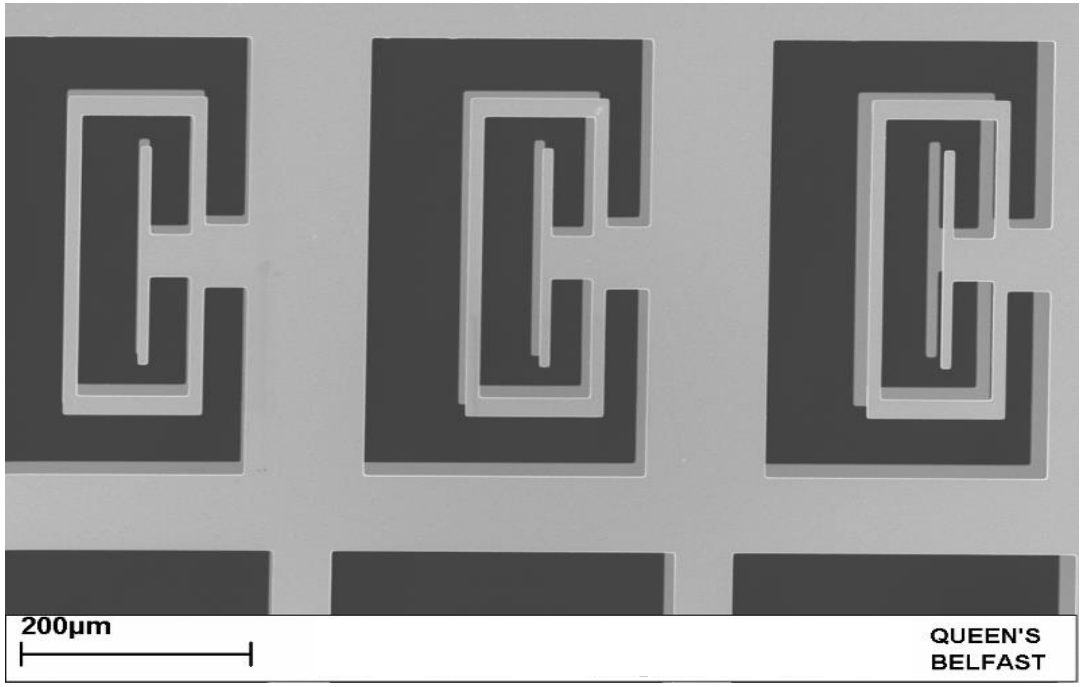
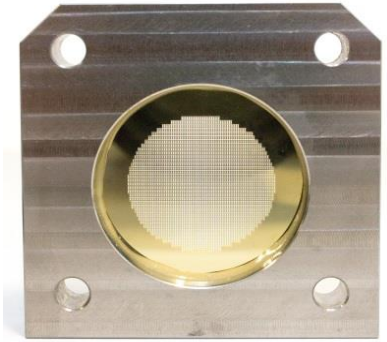
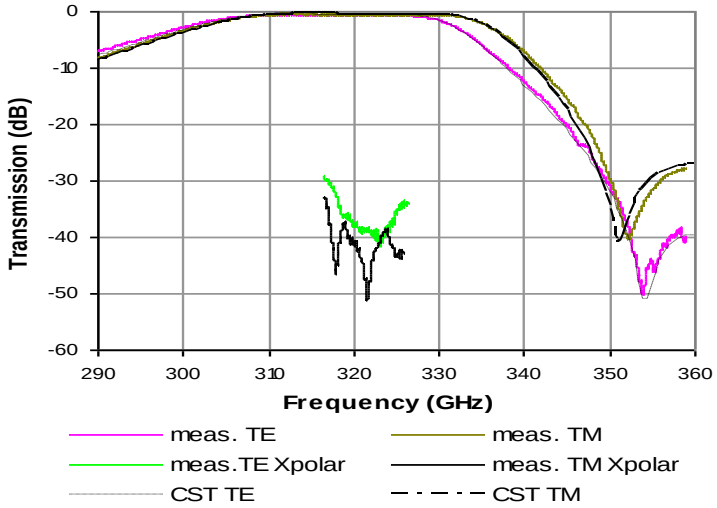
SEM photographs of part of unit cells of the dual polarisation FSS

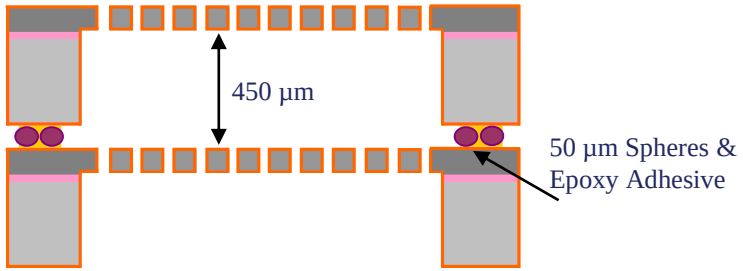
- Each 2 layer FSS is constructed using 5000 unit cells
- Manufacturing tolerances ± 2µm





Transmission TE/TM: 316-326GHz
Reflection TE/TM: 349.5-357.5 GHz





Printed FSS – MWS Breadboard Radiometer

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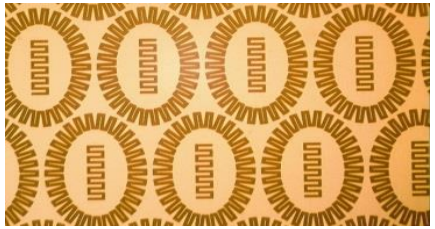
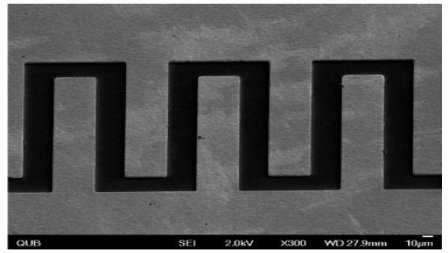
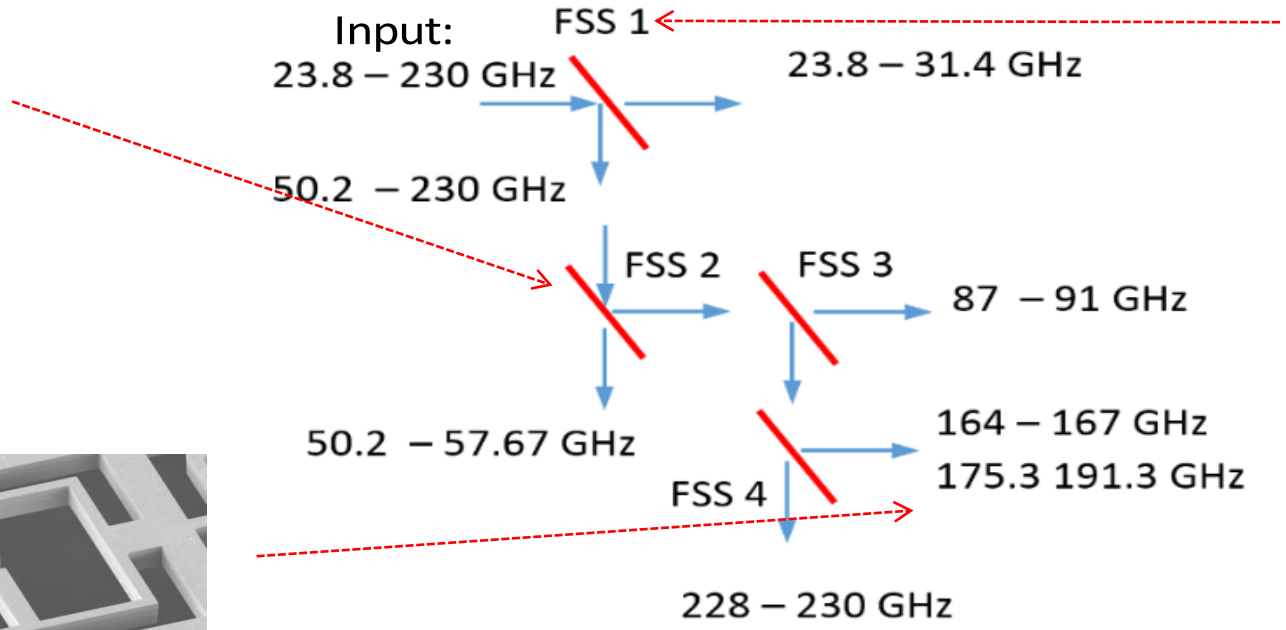
- Microwave Sounder Instrument, 23- 229 GHz

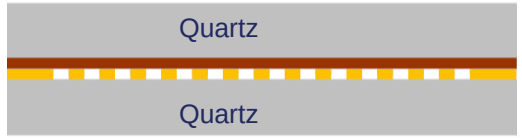
derivation of temperature and water profiles and information on cloud liquid water

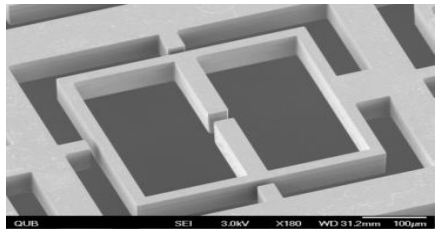
for numerical weather prediction and climate monitoring











Acknowledgements

CWI CENTRE FOR WIRELESS INNOVATION