

# *The CTRs (COMPACT TRIPLE-BAND RECEIVERS) for the ITALIAN RADIOTELESCOPES*

Alessandro Orfei INAF-IRA



KASI premises  
CTRs being shipped to Italy

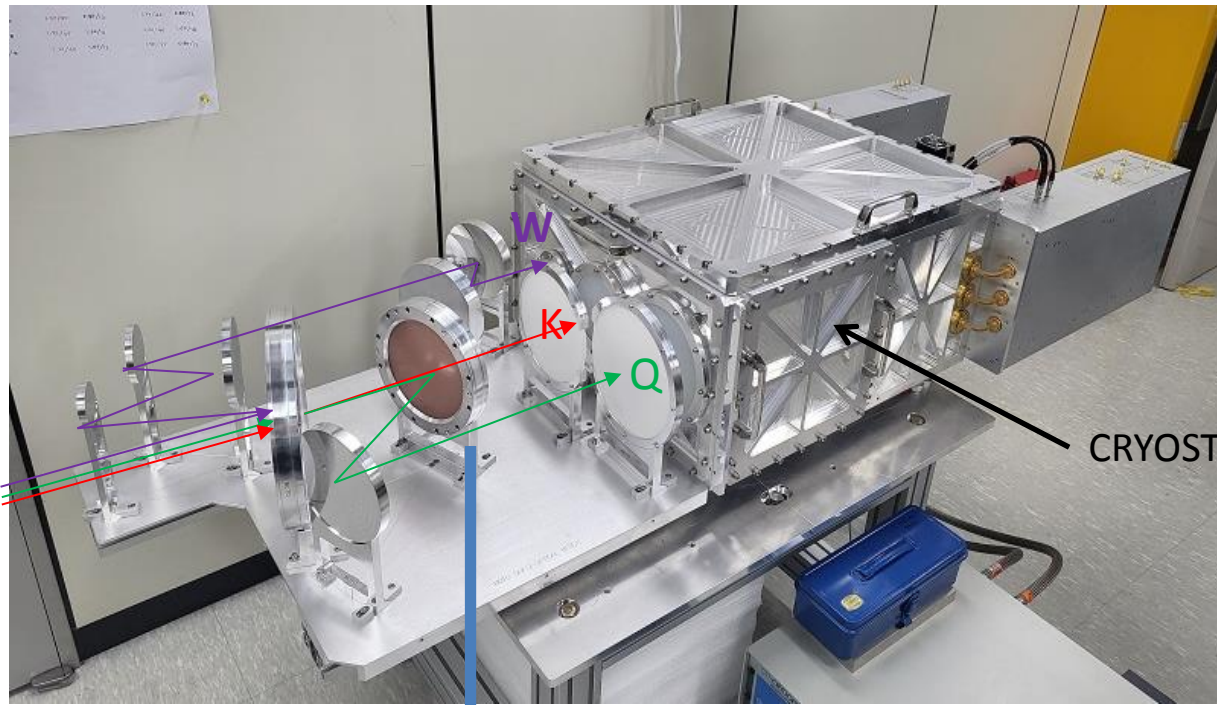


# OVERVIEW



- AIM: EQUIP MEDICINA, NOTO and SRT FOR SIMULTANEOUS VLBI OBSERVATIONS in the K, Q and W bands (13, 7 and 3mm)
- FUNDS FROM EU and ITALIAN MINISTRY of RESEARCH for  
"ENHANCING the SARDINIA RADIO TELESCOPE for STUDYING the UNIVERSE  
at HIGH RADIO FREQUENCY"
- DESIGN & CONSTRUCTION BY KASI (KOREA ASTRONOMY and SPACE SCIENCE INSTITUTE)
- RECEIVER SPECIFICATIONS BY INAF
- 3 YEARS DEVELOPMENT
- 3 CTR JUST DELIVERED on AUGUST 29th, 2022
- SIMULTANEOUS LCP+RCP 8 BANDS: 18-26GHz; 34-50GHz; 80-96GHz + 100-116GHz
- SKY BAND TUNABILITY VIA LOCAL OSCILLATOR TO COVER THE 96-100GHz GAP
- SIMULTANEOUS LCP+RCP SSB BANDS: K-band 4-12GHz; Q,  $W_{low}$ ,  $W_{high}$  2-18GHz
- MEASURED RECEIVER NOISE: K-band <60K; Q-band <70K;  $W_{low}$ ,  $W_{high}$  <130K
- MEASURED OVERALL CROSSPOL: < -22dB
- MEASURED IMAGE REJECTION: >25dB
- ≥80Hz SYNCHRONOUS NOISE MARK INJECTION IN THE 3 BANDS
- MEASURED POWER CONSUMPTION: 460W
- WEIGHT: 300Kg
- DIMENSIONS: FIT MED/NOTO/SRT SECONDARY FOCUS CONSTRAINTS ( $\approx 2.7 \times 1 \times 0.7$  m)

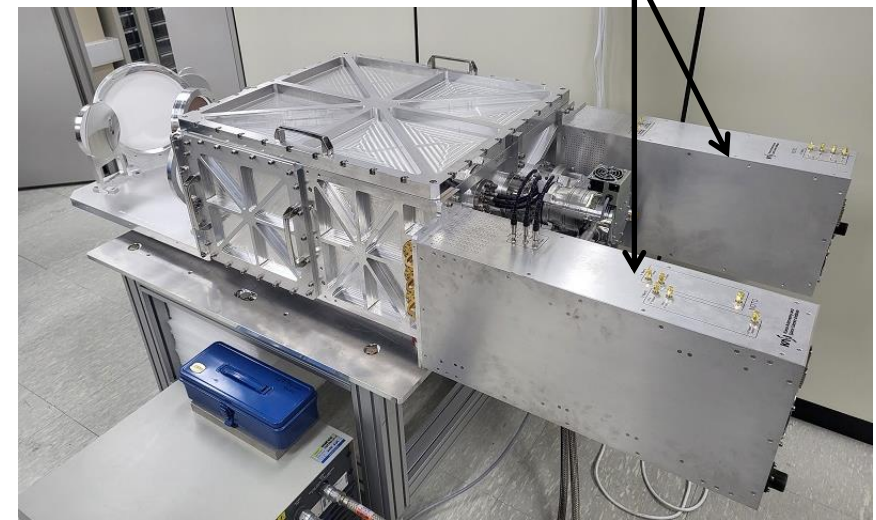
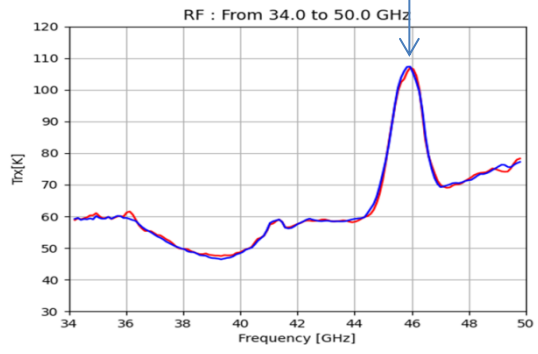




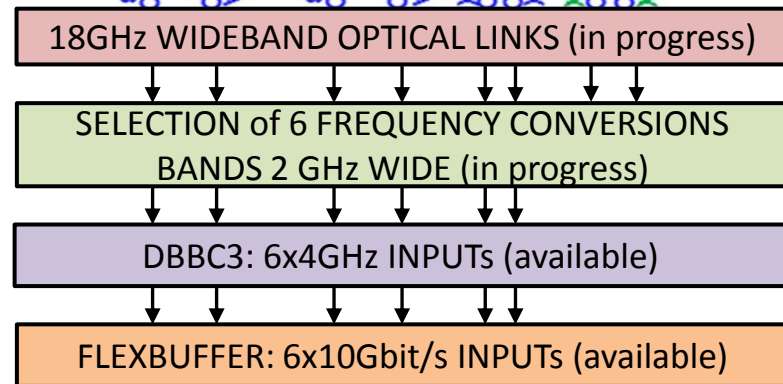
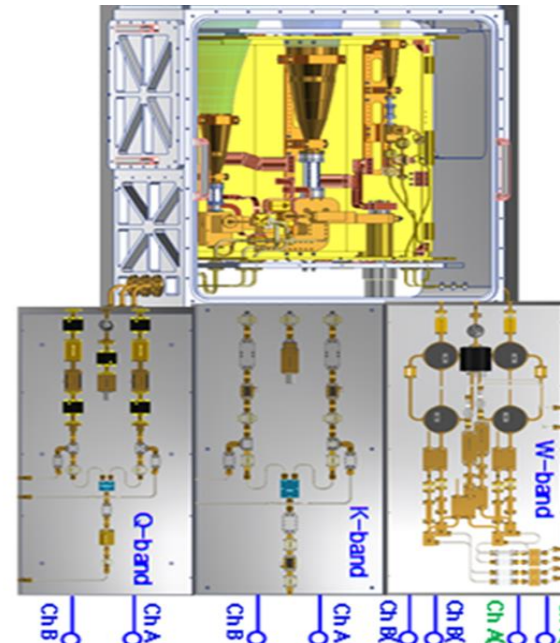
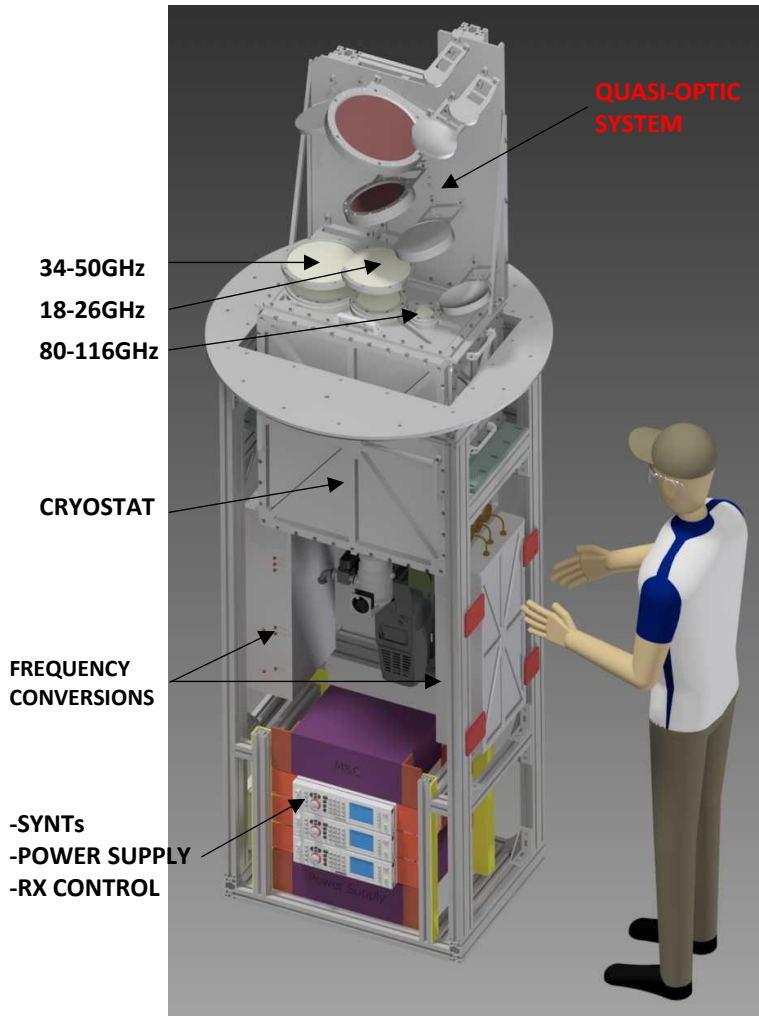
CRYOSTAT

FREQUENCY  
CONVERSIONS  
(8 OUTPUTS)

The Dichroic filter reflecting Q-band shows an "Anomaly effect".  
This increases the receiver noise at 46GHz.



# ITALY HIGH f VLBI: FROM the RX to the DBBC3



# ITALY HIGH f VLBI: WHAT ELSE

*NOTO and MEDICINA DON'T PROVIDE SURFACE ACCURACY TO OBSERVE at 3mm*

## WORK IN PROGRESS

1. **SRT:** COMPLETION OF THE INTEGRATION OF NEW EQUIPMENTS ON ANTENNA. ACTIVE SURFACE AVAILABLE
2. **NOTO:** NEW SUBREFLECTOR SURFACE (50 micron). ACTIVE SURFACE AVAILABLE
3. **MEDICINA:** INSTALLING ACTIVE SURFACE SYSTEM and NEW SUBREFLECTOR SURFACE

## TIMETABLE

**SRT:** SPRING/SUMMER 2023

**NOTO:** SPRING/SUMMER 2023

**MEDICINA:** END 2023

LOOK FOR AN INSTRUMENTAL DELAY CALIBRATION SCHEME!!