



ASIAA

# Array for Microwave Background Anisotropy

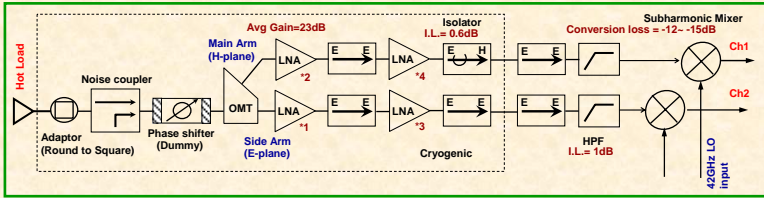
## 7-Element Antenna on Site Verification

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ASIAA



NTU Physics

### Rx Schematic and Spec.



Cryogenic: Cooled to 15 Kelvin

Vacuum: Achieved to  $2 \times 10^{-5}$  mbar

Operation Radio Frequency: 86-102GHz

Receiver Noise Temperature: 70K (Narrow band, BW=4MHz)

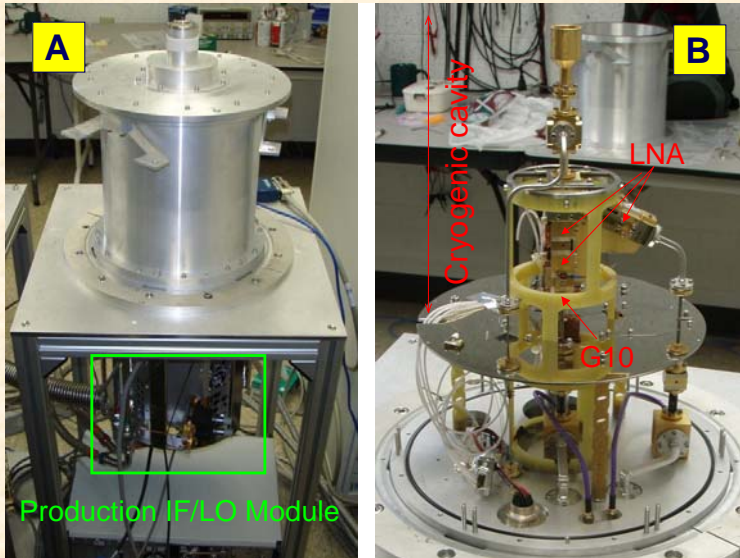
Pin switching difference power: 0.04dB (at optimum point)

### Pictures

(A) An antenna with supporting table under initial test in Hilo lab. The lower part is currently used production type IF/LO module.

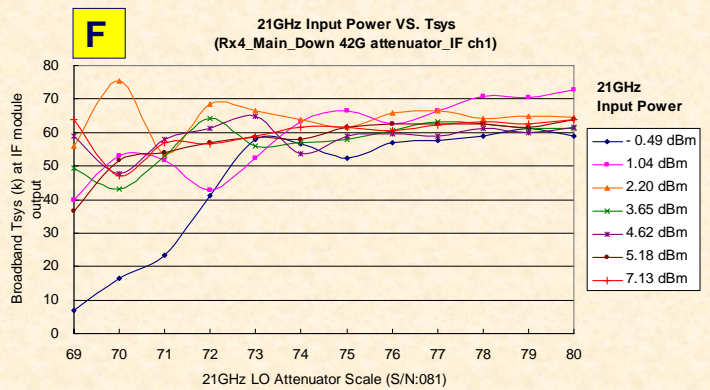
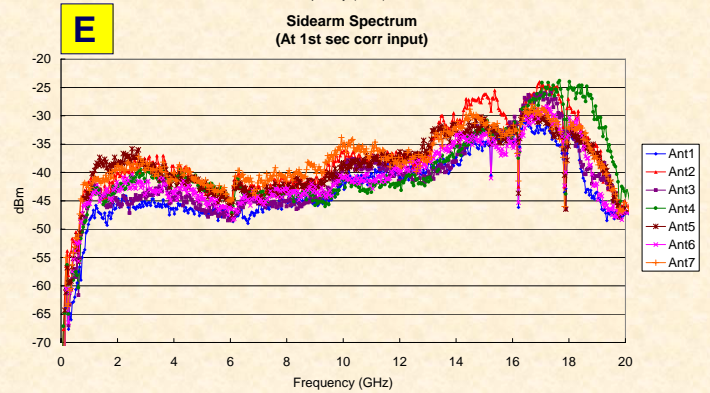
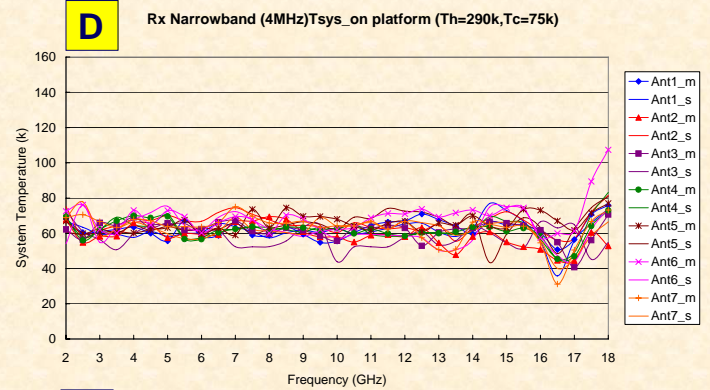
(B) Inside receiver chamber, the G10 structure is holding the RF chain and the LNA (Low Noise Amplifier) is assembled in the cryogenic (15k) cavity.

(C) 7-element antenna installation in compact configuration (0.6m baseline). With 60cm dish and GORETEX cover.



### Verify Results

(D) Rx Noise Temperature (E) Sidearm Spectrum (at correlator 1<sup>st</sup> sec. input) (F) Illustrate the vary DRO power and vary LO attenuation change the Tsys. (G) Power Table Record (2006.Aug.)



AMiBA Antenna Power Table (compact array)							
Antenna #	1	2	3	4	5	6	7
Rx#	3	4	2	1	6	5	7
IF/LO #	8	2	6	5	7	4	3
21GHz DRO (dBm)	1.28	1.05	0.83	2.01	1.9	0.98	1.82
42GHz LO output (dBm)	7.29	8.47	7.64	7.2	8.71	8.51	7.71
Attenuator Scale	60	79	70	61	66.5	70	69.5
PIN switch Difference (dB)	0.02	0.02	0.04	0.02	0.01	0.01	0.02
Y factor (with Pad, dB)	4.085	4.145	4.246	4.244	4.069	3.994	4.187
Pad before IF (dB)	3	6	1	3	6	3	10
Rx output (4m cable with HOT load, dBm)	9.33	11.03	9.503	7.271	4.351	4.151	8.185
Pad before 1st sec. (with HOT load, dB)	10+006	10+008	10+007	10+004	10+001	6+003	10+005
Input to 1st sec. (with HOT load, dBm)	-7.28	-7.61	-6.95	-7.37	-6.93	-8.41	-7.65
42GHz LO output (dBm)	12.33	7.64	6.28	7.81	8.59	13.21	7.4
Attenuator Scale	72	75	63.5	61.5	64.5	100.5	64.5
PIN switch Difference (dB)	0.02	0.01	0.02	0.02	0.02	0.01	0.02
Y factor (with Pad, dB)	4.28	3.998	3.994	4.114	4.024	4.136	4.145
Pad before IF (dB)	1	3	6	1	2	3	9
Rx output (4m cable with HOT load, dBm)	5.065	10.11	7.795	9.5	9.666	6.847	9.628
Pad before 1st sec. (with HOT load, dB)	10+002	10+007	10+007	10+007	10+004	10+004	10+007
Input to 1st sec. (with HOT load, dBm)	-7.4	-7.26	-7.75	-7.78	-7	-7.23	-7.93

PS: "Rx output power" was measured without compensation cable Initial at 2006.08.30 by Johnson  
But "Input power to 1st sec." was measured with initial compensation cable

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