S45mm - 4.5cm broad band C/X secondary focus receiver (4000-9300 MHz)

This is a broad-band receiver with two orthogonal linear polarizations (at a 45°-angle with the horizon). The receiver (in most setups simultaneously) delivers 4 basebands (each with two polarizations):

Overview

RX Name	Band	Frequency range [GHz]	Polarisation	Nr. of Horns	Horn position relativ to center of focus cabin
S45mm	C	4.0-9.3	dual-linear	1	Az: xx, arcsec, Elv: xx arcsec

Calibration Information

Frequency [GHz]	Channel	Polarisation	Tcal [K]	Tsys [K]	Sensitivity [K/Jy]	SEFD [Jy]	Aperture Eff. [%]	TMB/S [K/Jy]	Main Beam Eff. [%]	HPBW [arcsec]	Last update
5.250 (BB1, C-Band)	1+2	lin	3.1	35	1.60	22	56	2.0	71	140	Oct 2019
6.750 (BB2, C-Band)	1+2	lin	4.5	37	1.40	26	49	1.6	58	105	Oct 2019
6.668 (BB3, C-Band)	1+2	lin	3.6	34	1.39	24	49	1.7	60	109	Oct 2019
4.829 (BB4, C-Band)	1+2	lin	2.8	42	1.59	26	56	1.8	65	146	Oct 2019
6.30 (BB1, X-Band)	1+2	lin	3.8	30	1.55	19	55	2.2	70	118	Aug 2022
7.90 (BB2, X-Band)	1+2	lin	4.6	32	1.45	22	51	2.3	63	92	Aug 2022

normalized Gain curve (G = A0 + A1·Elv + A2·Elv2)			Observed in	confirmed
A0 = 0.9928	A1 = 4.212E-4	A2 = -6.158E-6	Jun 2016	Oct 2019

Comments:

- The gain curve was corrected for opacity (though it is small, < 0.02 throughout the band).
- See the table below for the list of basebands.

Baseband	Center Frequency	Bandwidth	Comment
1	5.250 GHz	2500 MHz	beware of strong RFI at frequencies < 4.5 GHz!
2	6.750 GHz	2500 MHz	
3	6.668 GHz	200 MHz	for methanol observations
4	4.829 GHz	200 MHz	for formaldehyde observations

Available receiver versions (for OBSINP) - currently being updated

Version	Description	Details
BB_continuum	standard continuum backend with internal polarimeter	bandwidth 500 MHz

Version	Description	Details
EDDPOL_MULTIFIBA	spectro-polarimeter backend	

Below here: Information is currently updated.

Spectroscopy modes and resolution

Baseband	f_center	Bandwidth	N_Chan	Df	Dv	dv
	GHZ	MHz		kHz	km/s	km/s
1	5.25	2500	65536	38.1	2.18	2.53
2	6.75	2500	65536	38.1	1.69	1.96
3	6.668	200	65536	3.05	0.137	0.159
4	4.829	200	65536	3.05	0.189	0.219

N_Chan … number of spectral channels

f_center … center frequency

Df … Channel separation (in frequency)

Dv … Channel separation (in velocity)

dv … Velocity resolution (dv=1.16*Dv)

Tcal and Tsys measurements