7mm secondary focus receiver (33500-50000 MHz)

This is a 4-channel two horn system for continuum, spectroscopy and VLBI observations.
Attention: When frequencies lower than 35 GHz are selected, the receiver operates in double sideband mode for some parts of the observed bandpass. Please contact staff for advice.

Overview

RX Name	Band	Frequency range [GHz]	Polarisation	Nr. of Horns	Horn position relativ to center of focus cabin
S7mm	Q	33.5-50.0	dual-circular	2	Horn 1: Az: xx arcsec, Elv: xx arcsec, Horn 2: 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. [%]	FWHM [arcsec]	Last update
36.25	A/B	LCP/RCP	10.6	124	0.78	160	27	1.7	44	23.0	Oct 2021
38.75	A/B	LCP/RCP	15.0	144	0.73	197	26	1.8	40	21.2	Oct 2021
41.25	A/B	LCP/RCP	12.2	110	0.64	171	23	1.7	38	20.7	Oct 2021
43.75	A/B	LCP/RCP	10.8	136	0.60	228	21	1.6	36	19.7	Oct 2021
46.25	A/B	LCP/RCP	10.2	125	0.59	214	20	1.6	36	19.1	Oct 2021
48.75	A/B	LCP/RCP	10.0	187	0.51	369	18	1.6	32	18.1	Oct 2021

normalized Gain curve (G = A0 + A1·Elv + A2·Elv2)			Observed in	confirmed
A0 = 0.8349	A1 = 8.312E-3	A2 = -1.046E-04	Below 40 GHz, Oct 2021	
A0 = 0.7852	A1 = 1.126E-2	A2 = -1.475E-04	40-45 GHz, Oct 2021	
A0 = 0.7608	A1 = 1.487E-2	A2 = -2.310E-04	45-50 GHz, Oct 2021	

Comments:

- **Please note, that Tsys and SEFD are given for zenith. For sensitivity calculations, please take the atmosphere's opacity into account!**
- The data was corrected for sky opacity with observations from the WVR. Typical zenith opacities under good weather conditions are around 0.07 to 0.1 at 42 GHz.
- For informations about the old parameters please contact Uwe Bach (ubach_at_mpifr.de).

Available receiver versions (for OBSINP)

Version	Description	Details
continuum_37.5ghz	standard continuum backend 2 basebands, 35-40 GHz	2x 2.5 GHz
continuum_42.5ghz	standard continuum backend 2 basebands, 40-45 GHz	2x 2.5 GHz
continuum_47.5ghz	standard continuum backend 2 basebands, 45-50 GHz	2x 2.5 GHz

Below here: Information is currently updated.

Version description for OBSINP

RX Name	Wavelength [cm]	Frequency (center) [GHz]	Nr. of Horns
S7mm double beam RX	0.7	33.5-50.0 (42.0)	2
Version:	**Comment**		
1. Continuum (BW: 2.5 GHz)	Broad Band Continuum		
2. Line (BW: 2500 MHz)	Spectroscopy/Continuum using optical IF		
Horn offsets [arcsec]	107.7,-451.8; 219.2,-451.8		

Channel assignment in the MBFITS data files

Note that the narrow line and VLBA IF channels are usually only available when the specific line version of the receiver was selected. In addition for most receivers with narrow line channels the cables at the patch board need to be connected by the receiver group.

To select different channel numbers in OBSINP, the online plot, or the toolbox the numbers have to be specified like c(1)+c(2) to add channel 1 and 2. E.g. channel 1 and 2 contain the LCP and RCP broadband channels, then "OnlPlot pen='c(1)+c(2)'" or "toolbox use='c(1)+c(2)'" will select these channels. In OBSINP the pen can be directly specified in the receiver selection menu.

Abbreviations:
SB: narrow band channel (Schmalband-Kanal), 100 MHz band width
BB: digital broad band channel (Breitband-Kanal), band width varies for different receivers
VLBA: VLBA IF, 500 MHz band width
BW: band width
TP: total power

7mm SFK dual horn receiver			
Channel	**IF**	**Pol.**	**Comment**
1	2.5 GHz	LCP	TP A, horn 1
2	2.5 GHz	RCP	TP B, horn 1
3	2.5 GHz	LCP	TP A, horn 2
4	2.5 GHz	RCP	TP B, horn 2

Spectroscopy modes and resolution

To be done.

Tcal and Tsys measurements

To be done.