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.

Calibration Information

This are preliminary results from first tests and can easily be off by 10 or 15 %.

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
35.75	A	LCP	7.5	77	0.76	102	26	1.6	47	24.4	May 2018
35.75	B	RCP	6.9	83	0.75	112	26	1.6	47	24.5	May 2018
38.25	A	LCP	9.3	90	0.62	145	22	1.6	38	22.5	May 2018
38.25	B	RCP	9.1	94	0.66	143	23	1.6	40	22.6	May 2018
42.75	A	LCP	9.5	84	0.76	110	26	1.5	50	20.9	May 2018
42.75	B	RCP	8.7	85	0.77	111	27	1.5	50	21.1	May 2018
44.1 (narrow band)	A+B	LCP+RCP	13	100	0.66	140	23	1.67	40	19.5	Dec 2019
45.25	A	LCP	8.5	99	0.63	156	22	1.5	42	19.7	May 2018
45.25	B	RCP	8.2	103	0.65	159	22	1.5	47	19.8	May 2018

normalized Gain curve (G = A0 + A1·Elv + A2·Elv2)			Observed in	confirmed
A0 = 0.897	A1 = 5.93E-3	A2 = -8.52E-05	Below 40 GHz, Aug 2018	
A0 = 0.897	A1 = 7.85E-3	A2 = -1.5E-04	Above 40 GHz, May 2018	

Comments:

- **Please note, that Tsys and SEFD are given for zenith. For sensitivity calculations, please take the atmosphere's opacity into account!**
- The new gain curves were corrected for opacity.
- Opacity correction was done with a zenith opacity of 0.06-0.08. 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).

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				**Centre Frequency at version**		
Channel	**IF**	**Pol.**	**Comment**	**37.5 GHz_Continuum**	**42.5 GHz_Continuum**	**47.5 GHz_Continuum**
1	2.5 GHz	LCP	TP A, horn 1	36.25 GHz	41.25 GHz	46.25 GHz
2	2.5 GHz	RCP	TP B, horn 1	36.25 GHz	41.25 GHz	46.25 GHz
3	2.5 GHz	LCP	TP A, horn 2	38.75 GHz	43.75 GHz	48.75 GHz
4	2.5 GHz	RCP	TP B, horn 2	38.75 GHz	43.75 GHz	48.75 GHz

Spectroscopy modes and resolution

To be done.

Tcal and Tsys measurements

To be done.