

# 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

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	15.0	110	0.73	171	23	1.7	38	20.7	Oct 2021
43.75	A/B	LCP/RCP	15.0	136	0.73	228	21	1.6	36	19.7	Oct 2021
44.1 (narrow band)	A+B	LCP+RCP	13	100	0.66	140	23	1.67	40	19.5	Dec 2019
46.25	A/B	LCP/RCP	15.0	125	0.73	214	20	1.6	36	19.1	Oct 2021
48.75	A/B	LCP/RCP	15.0	187	0.73	369	18	1.6	32	18.1	Oct 2021
normalized Gain curve ( $G = A0 + A1 \cdot \text{Elv} + A2 \cdot \text{Elv}^2$ )							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).

## Version description for OBSINP

RX Name	Wavelength [cm]	Frequency (center) [GHz]	Nr. of Horns
<b>S7mm double beam RX</b>	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		

RX Name	Wavelength [cm]	Frequency (center) [GHz]	Nr. of Horns
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.

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