7mm secondary focus receiver (41600-44400 MHz)

This is a 2-channel system for VLBI observations. The whole receiver was reconditioned in late 2012. A new double-horn system is under construction. It should become operational in 2016.

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
42.0	A	LCP	13.8	108	0.53	196	19	1.5	36	19.8	Mar 2009
42.0	B	RCP	12.2	131	0.53	248	19	1.5	35	19.8	Mar 2009

normalized Gain curve (G = A0 + A1·Elv + A2·Elv2)			Observed in	confirmed
A0 = 0.8806	A1 = 5.8673E-3	A2 = -7.1243E-05	Dec 2007	
A0 = 0.8800	A1 = 6.9970E-3	A2 = -1.0210E-04	Mar 2009	

Comments:

- The new gain curves were corrected for opacity.
- Opacity correction was done with a zenith opacity of 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 Multifrequency RX	0.7	41.6-44.4 (42.9)	1
Version:	**Comment**		
1. Continuum (BW: 2 GHz)	Broad Band Continuum		
2. Line (BW: 500 MHz)	Spectroscopy/Continuum using VLBA IF + VLBA IF Polarimeter		
3. Pulsar (BW: 500 MHz)	Pulsar 500 MHz BW Version		
Horn offsets [arcsec]	-466.2,58.6		

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 single horn receiver			
Channel	**IF**	**Pol.**	**Comment**
1	SB	LCP	TP A
2	SB	RCP	TP B
3	SB	cross	cos AB
4	SB	cross	sin AB
5	VLBA	LCP	TP A
6	VLBA	RCP	TP B
7	VLBA	cross	cos AB
8	VLBA	cross	sin AB
9	BB	LCP	TP A
10	BB	RCP	TP B

Spectroscopy modes and resolution

BW	**nchan**	**nu**	**Df**	**Dv**	**dv**
MHz		**MHz**	**kHz**	**km/s**	**km/s**
100	32768	41500	3.1	0.022	0.026
100	32768	42500	3.1	0.022	0.025
100	32768	43500	3.1	0.021	0.024
100	32768	44500	3.1	0.021	0.024
500	32768	41500	15.3	0.110	0.128
500	32768	42500	15.3	0.108	0.125
500	32768	43500	15.3	0.105	0.122
500	32768	44500	15.3	0.103	0.119

BW ... band width
nchan ... number of spectral channels
nu ... center frequency
Df ... Channel separation (in frequency)
Dv ... Channel separation (in velocity)
dv ... Velocity resolution (dv=1.16*Dv)

Tcal and Tsys measurements

(No correction for angular size of NGC7027 was applied!)