

Effelsberg-Bonn HI Survey (EBHIS)

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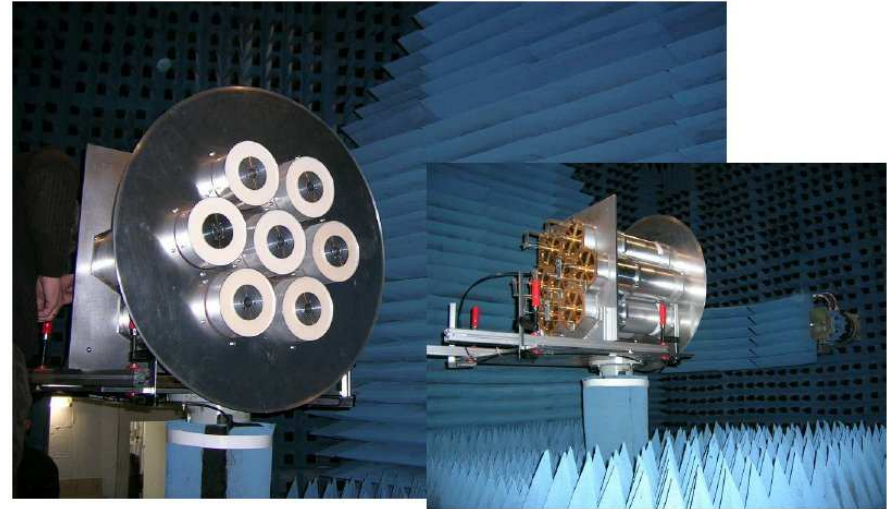
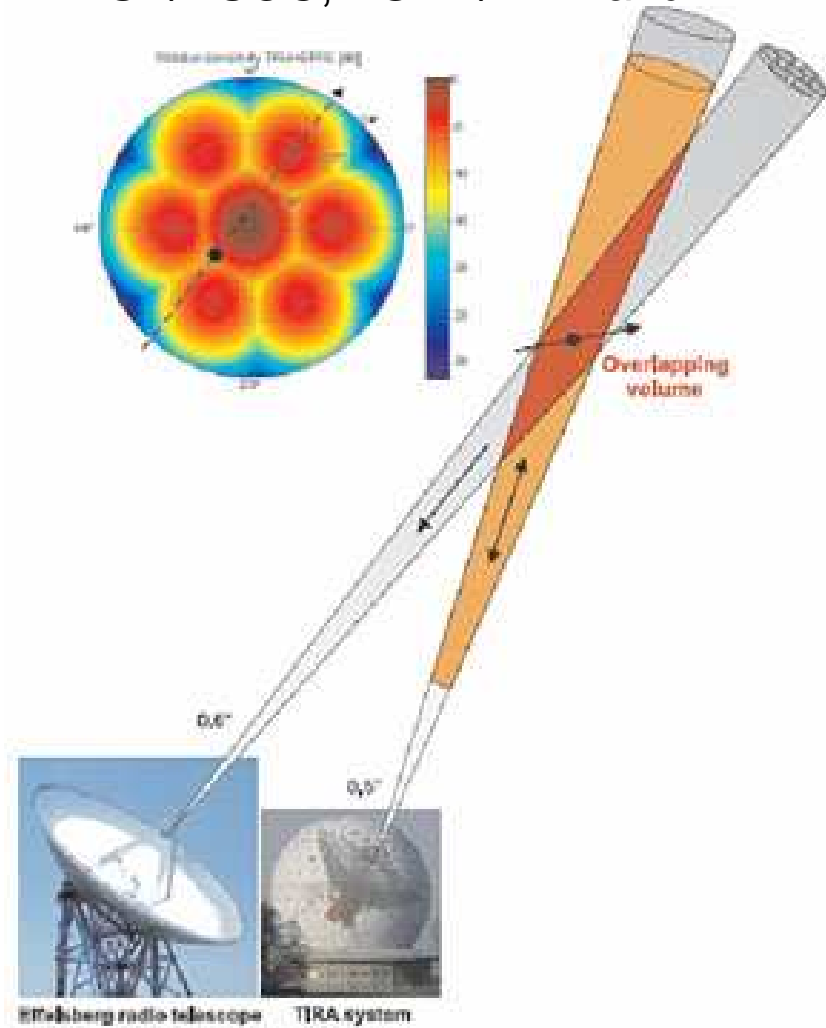
Max-Planck-Institut
für Radioastronomie



universität  **bonn**

EBHIS: receiver system

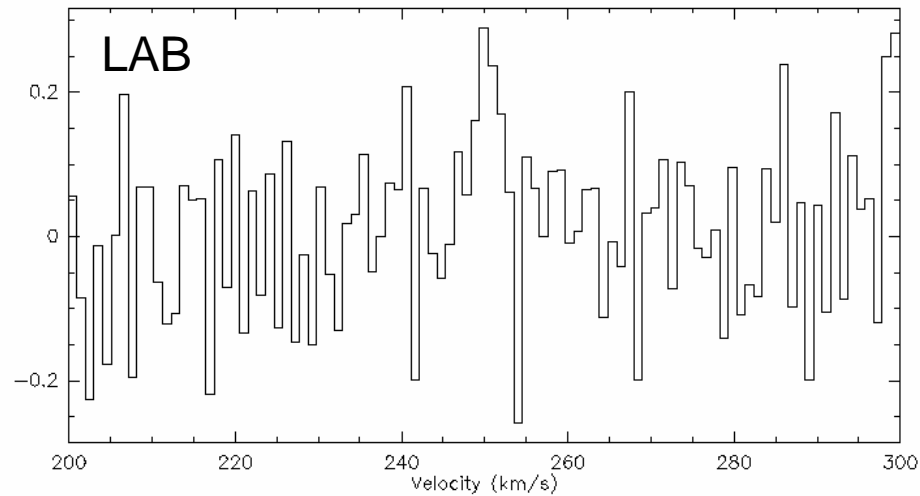
ESA/ESOC, FGAN/FHR and MPIfR



EBHIS concept

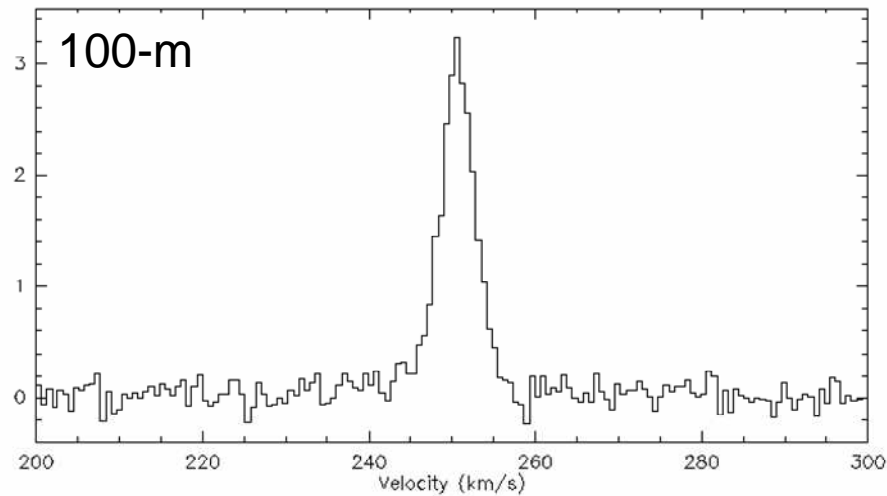
- Galactic and extragalactic HI survey
 - Galactic part
 - High angular resolution → fully sampled grid (3 arcmin separation)
 - High spectral resolution → close to 1 kms^{-1} CNM
 - High speed dumping → 1 second RFI mitigation
 - Multiple coverages → stray radiation correction

EBHIS concept



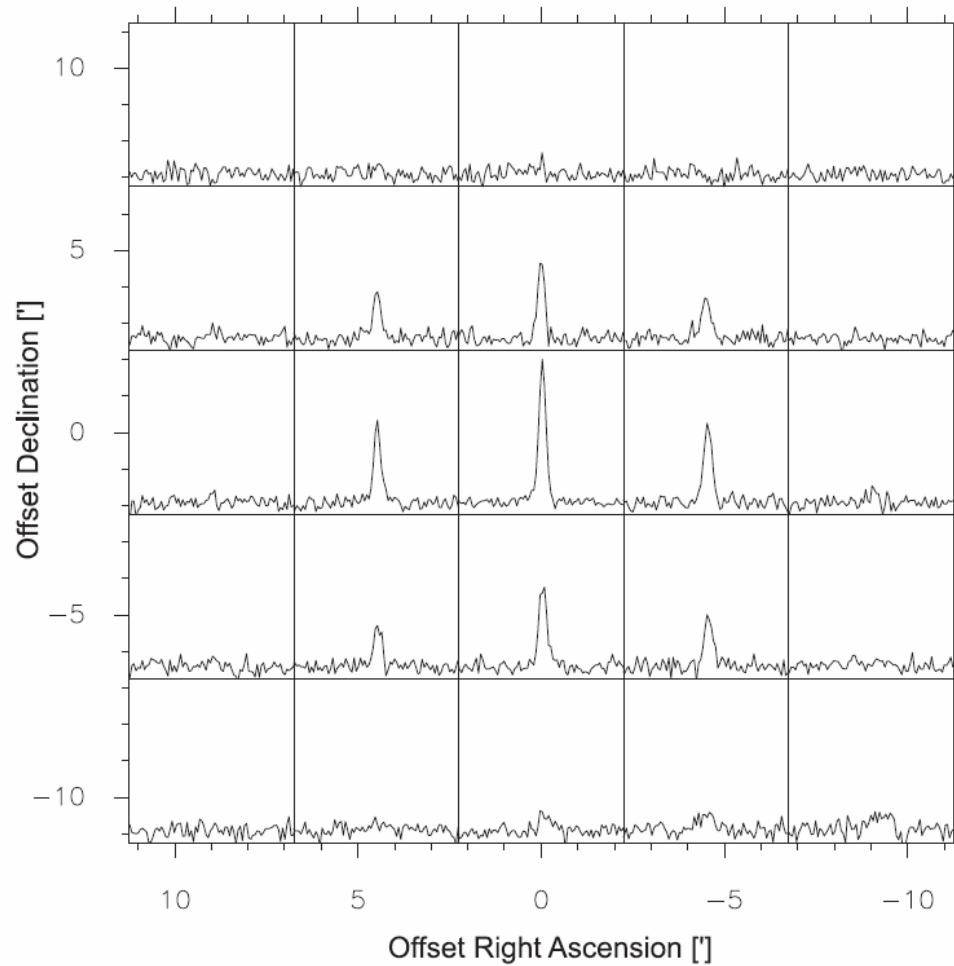
HVC 289+33+251

Brüns & Westmeier 2004, A&A 426, L9



Beam filling is different !

EBHIS concept



HVC 289+33+251

Brüns & Westmeier 2004, A&A 426, L9

EBHIS concept

- Galactic and extragalactic HI survey
 - Galactic part
 - High angular resolution → fully sampled grid (3 arcmin separation)
 - High spectral resolution → close to 1 kms^{-1} CNM
 - High speed dumping → 1 second RFI mitigation
 - Multiple coverages → stray radiation correction
 - Extragalactic part
 - Competitive to other multifeed survey projects
 - High spectral resolution
 - Inherent Radio-Frequency-Mitigation (RFI) strategy
 - Large survey area
 - Doing everything at the same time (galactic + extragalactic)

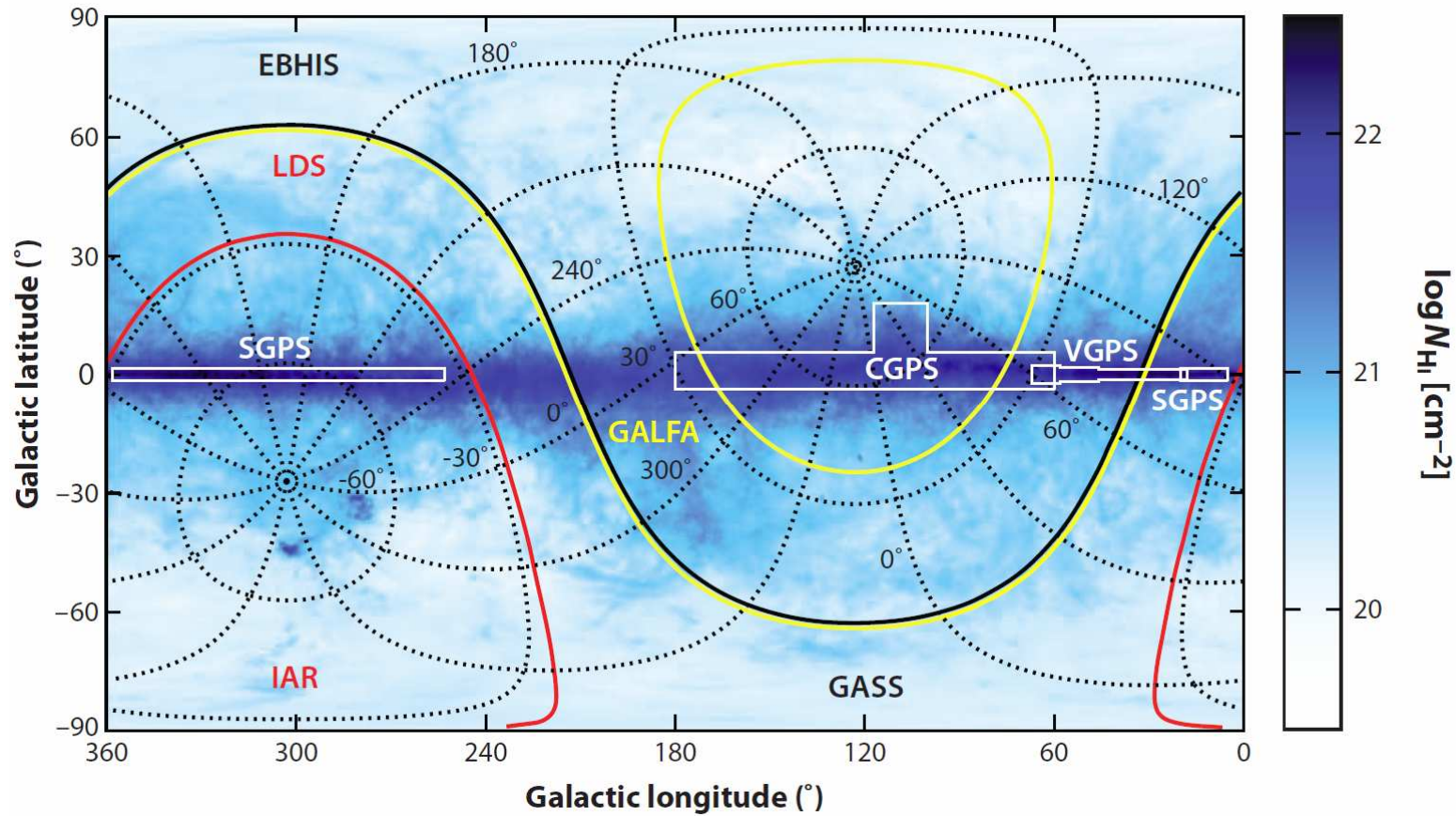
EBHIS concept

- Focus on the SDSS-area to optimize the scientific yield

	Area [sq. Deg.]	beam	z	mJy/b.a.	$N_{\text{HI}}[10^{18}\text{cm}^{-2}]$	
LAB	41300	35'	-.-	620	3.3	
HIPASS	29300	15'	0.05	13	-.-	
GASS	20600	15'	-.-	95	2.6	
ALFALFA	7100	3.5'	0.06	1.6	-.-	
GALFA	7100	3.5'	-.-	13.2	3.2	
EBHIS	8500	9'	0.07	5/2	-.-	
EBHIS	20600	9'	-.-	12/6	0.9/0.4	

EBHIS concept

Galactic survey areas



EBHIS concept

- Timeline
 - Galactic part: 1.5 years
 - Extragalactic part: 5 years
 - 100 days of backup time at the 100-m dish (Plan-B) each of 16 hours
 - Designed for remote observations
- Funding
 - Deutsche Forschungsgemeinschaft (DFG, KE757/7-1)
 - Hardware
 - Travel expenses
 - PostDoc Position
 - Ph. D. Positions
- Data distribution
 - http://www.astro.uni-bonn.de/~webaiub/english/tools_ebhissurvey.php

EBHIS: receiver system

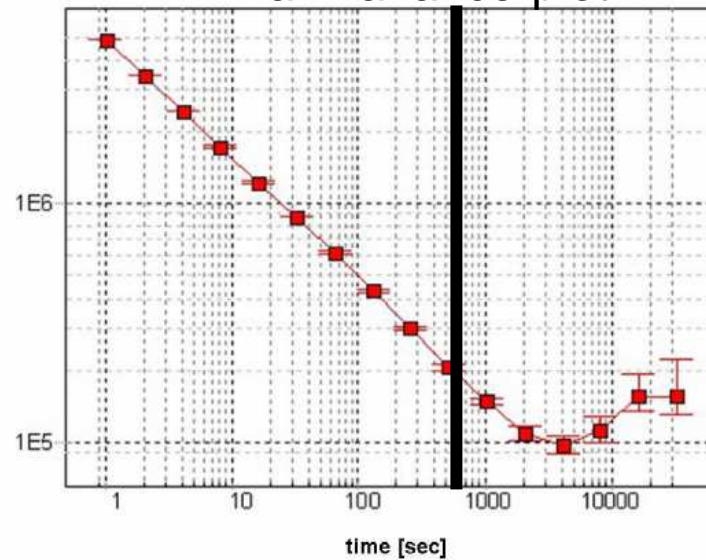
- EBHIS concept
 - Effelsberg 100-m dish seven feed receiver system
 - Offset-feed linear polarisation
 - Central-feed circular polarisation
 - 21 to 24 K system temperature
 - FPGA-Spectrometer
 - 16384 spectral channels
 - Recording of 14 spectral channels
 - 8-bit sampling
 - 0.5 second dump time
 - 100 MHz nominal bandwidth (-1000 kms^{-1} to 20.000 kms^{-1})
 - 6.1 kHz channel width (1.3 kms^{-1})

EBHIS setup: FPGA spectrometer

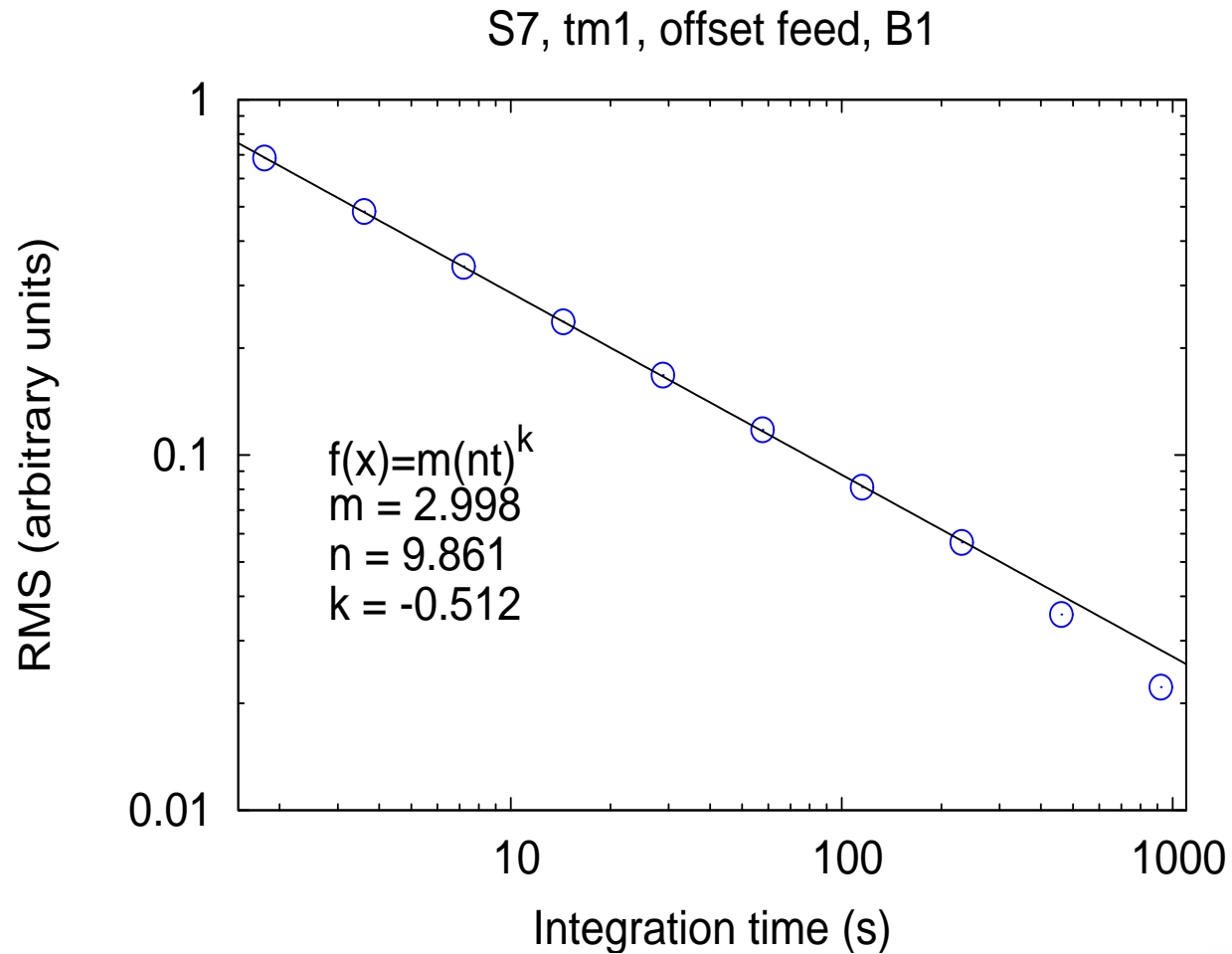


B. Klein (MPIfR)

Allan variance-plot

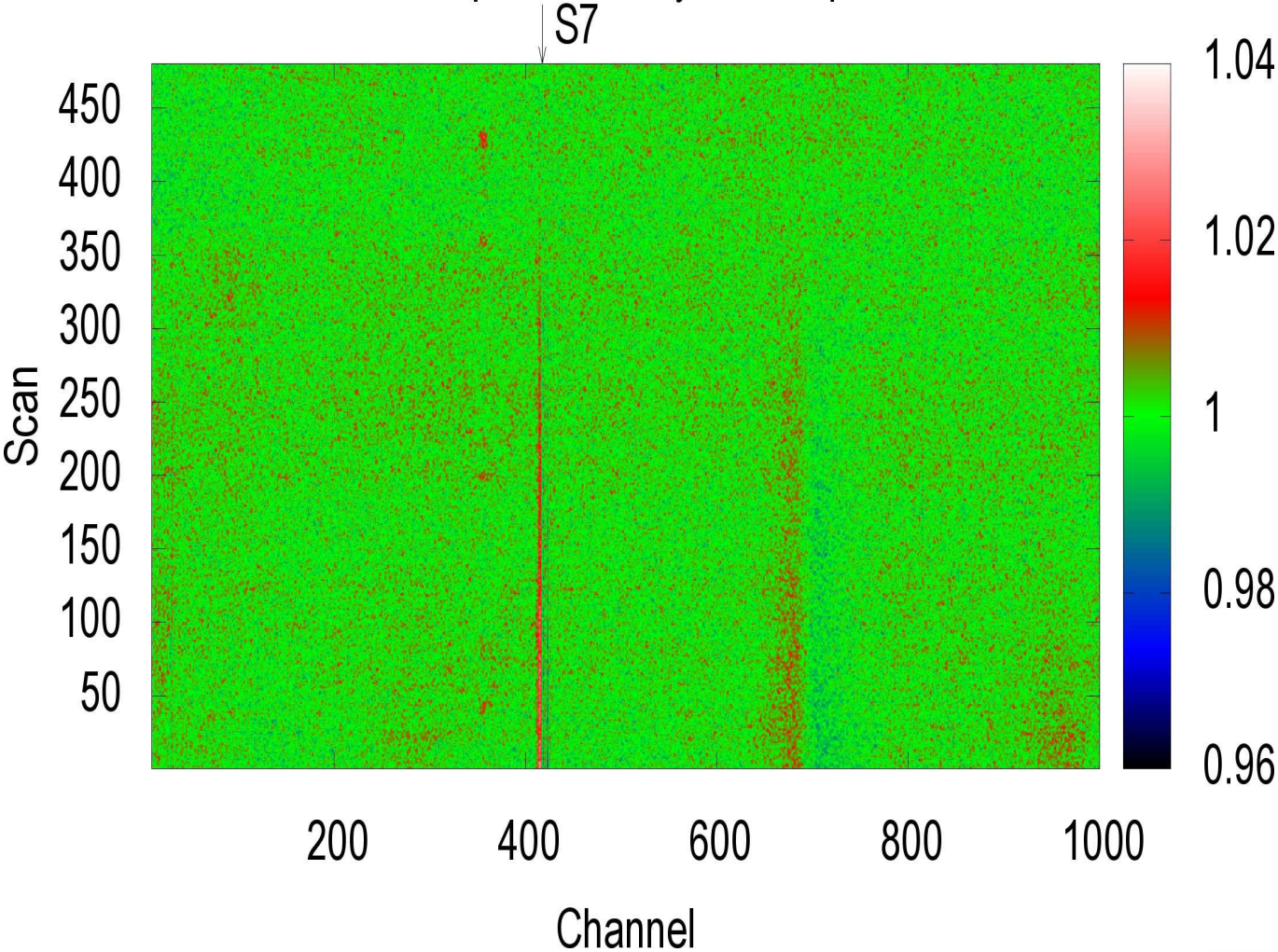


Current status: receiver performance

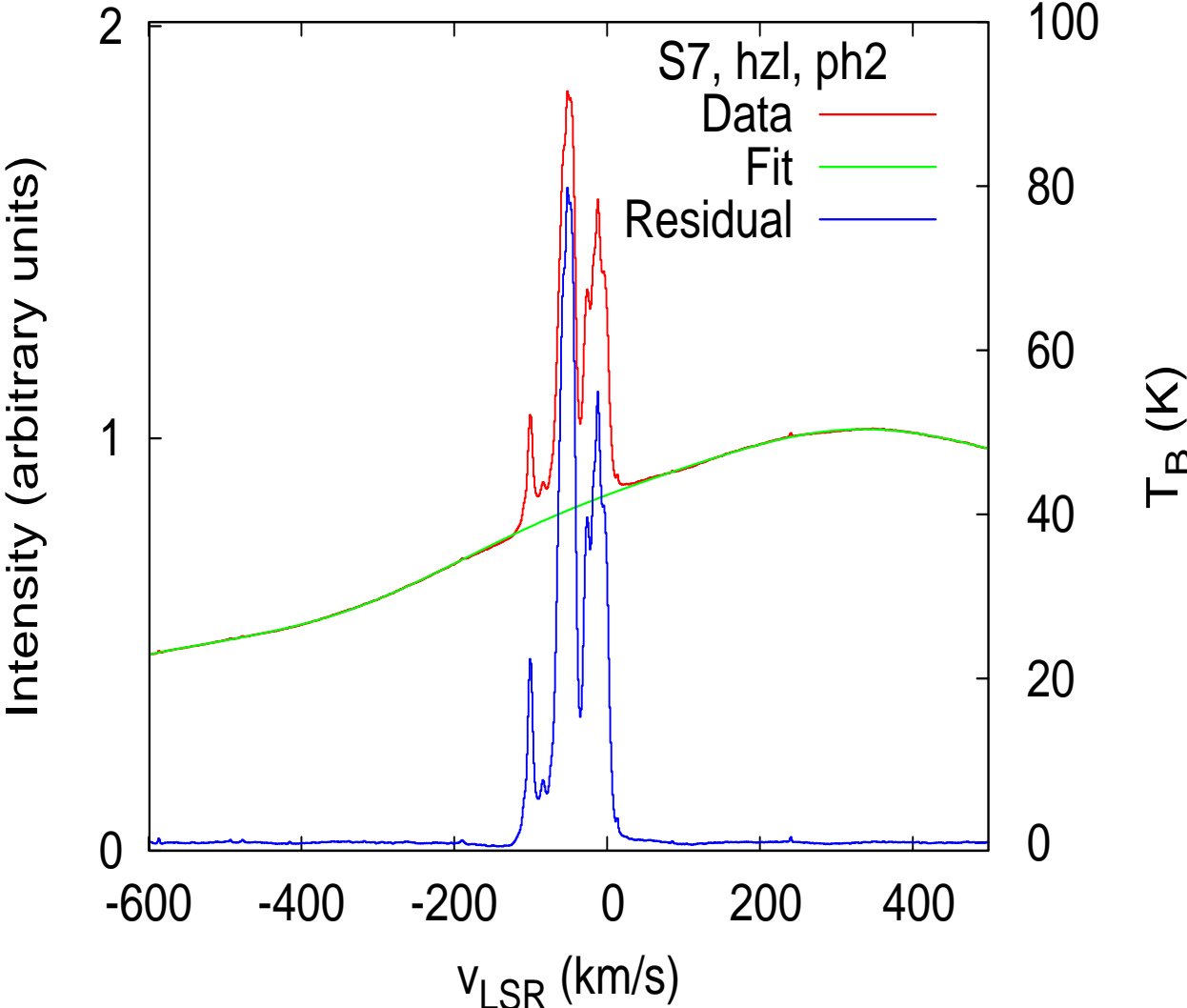


current status: Milky Way data

0.45 s dumps divided by mean spectrum



current status: Milky Way data

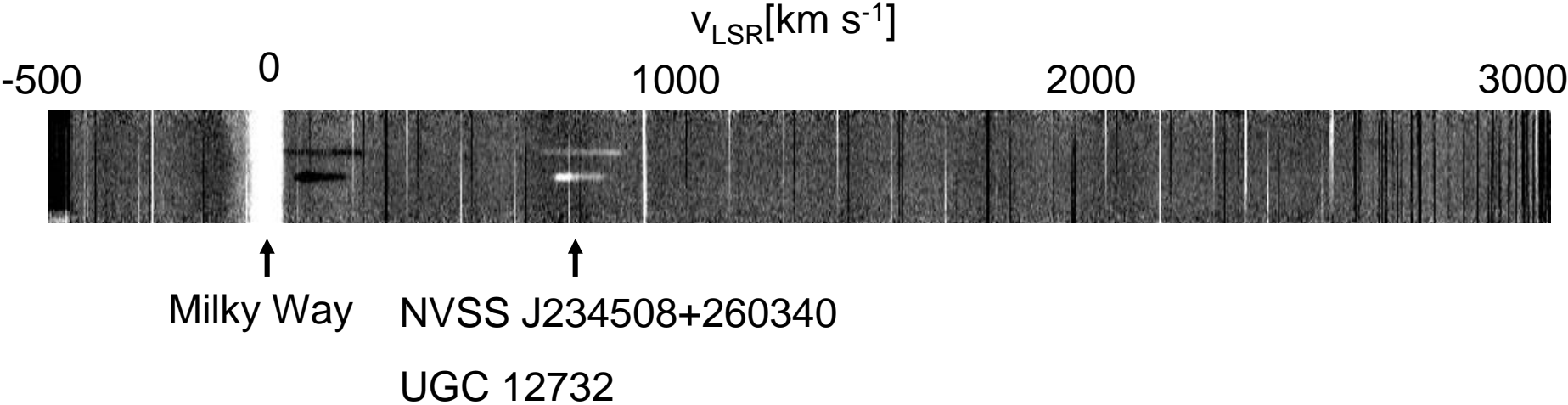


Current status: performed observations

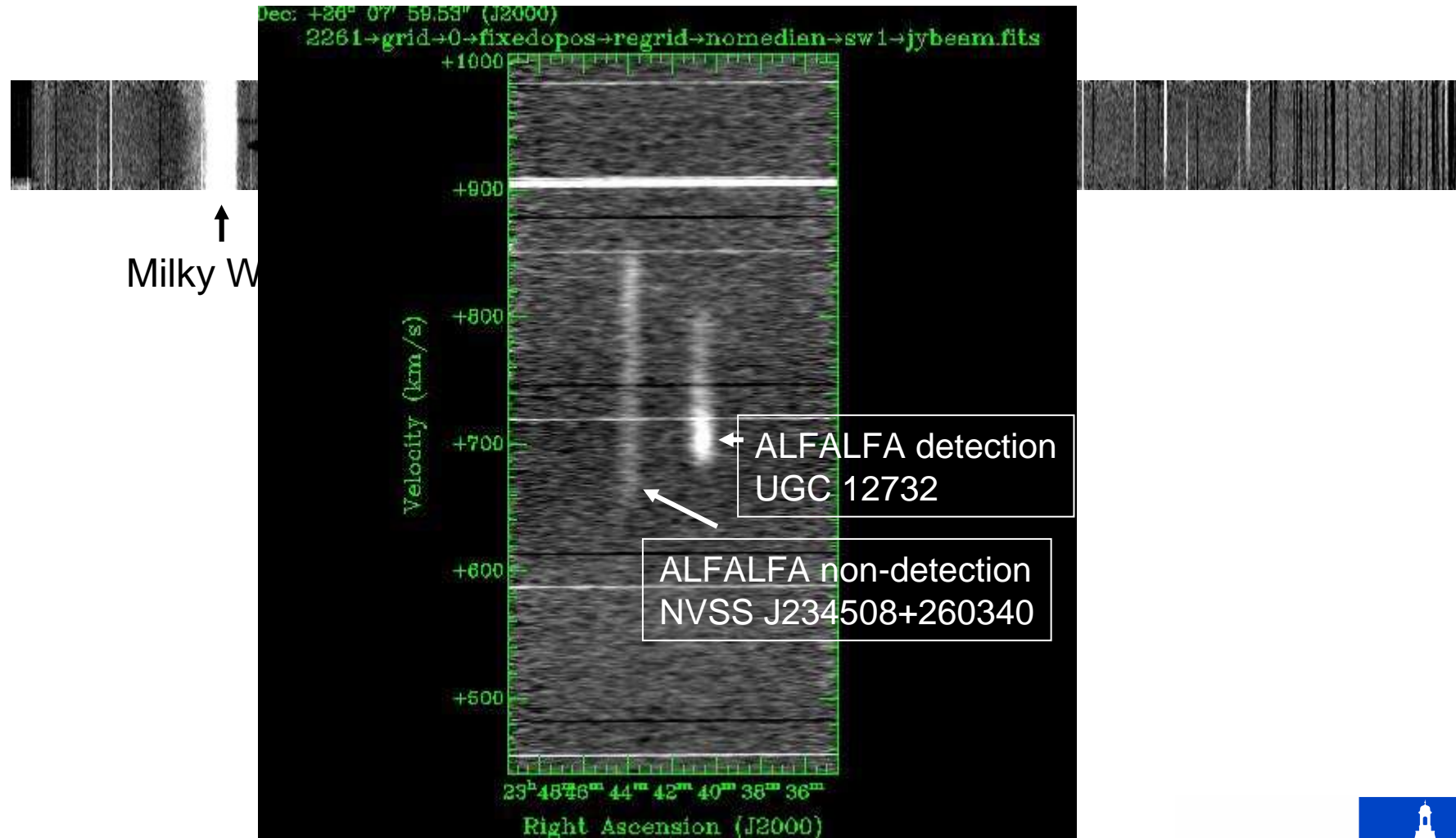
- Project status
 - Approved open time program with initially 600 hours of granted observing time for 2009
 - 200 hours already observed (~1500 sq. Degrees)
 - Selected areas/targeted observation
 - Feasibility checks

- ALFALFA Anti-Virgo field (22 mK /15 mJy/b.a)
- Coma cluster (22 mK)
- M81/M82 group (nearly completed)
- Northern Tip Magellanic Stream (GASS extension 150 sq. Deg.)
- HVC134+55
- Spitzer first look
-

Current status: extragalactic data

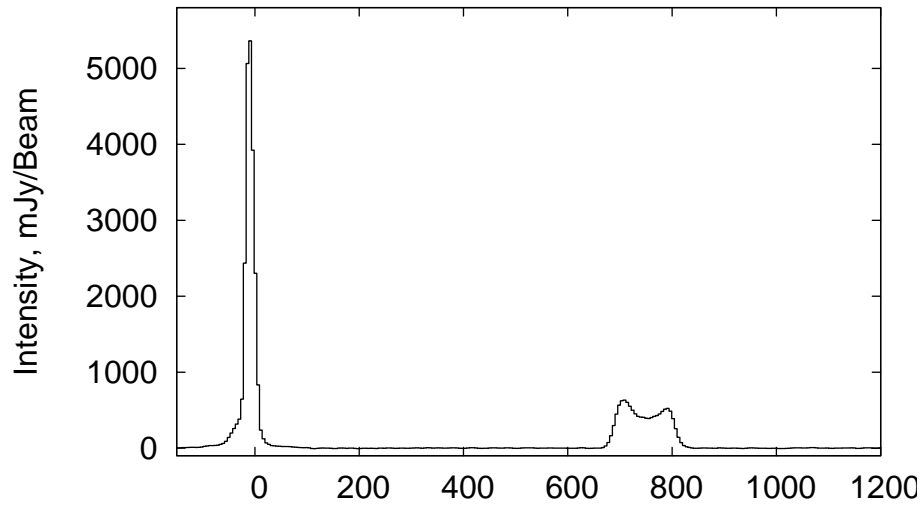


Current status: extragalactic data

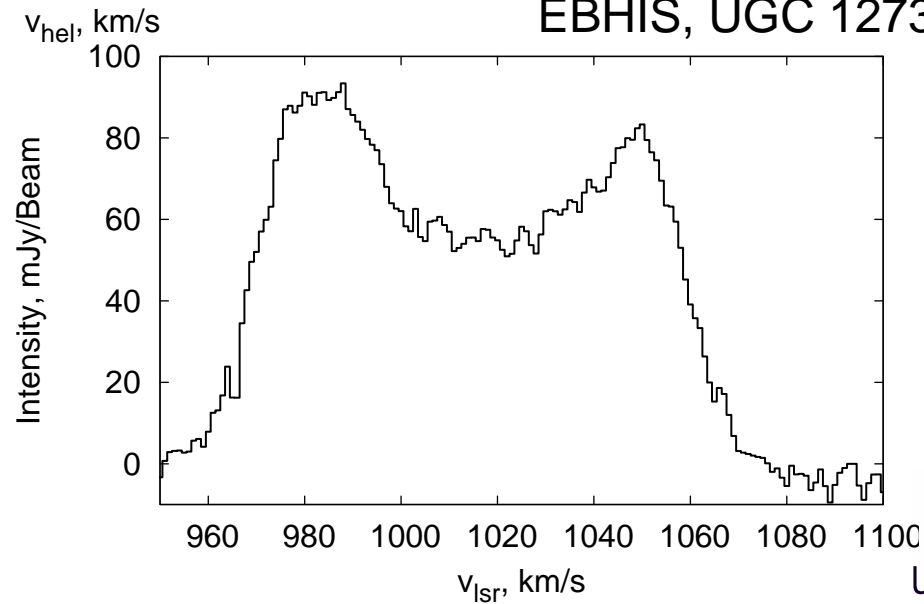


Current status: extragalactic data

AGC 12732, Arecibo



EBHIS, UGC 12732



Current status: timeline and etc.

- Project status
 - Approved open time program with initially 600 hours of granted observing time for 2009
 - 200 hours already observed (~1500 sq. Degrees)
 - Selected areas/targeted observation
 - Feasibility checks
 - Next observing period July to October 2009