

# Effelsberg-Bonn HI Survey (EBHIS)

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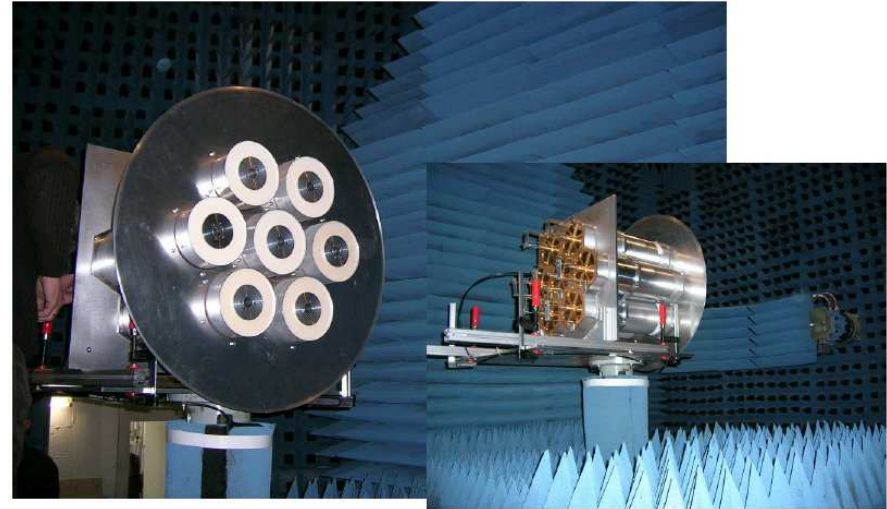
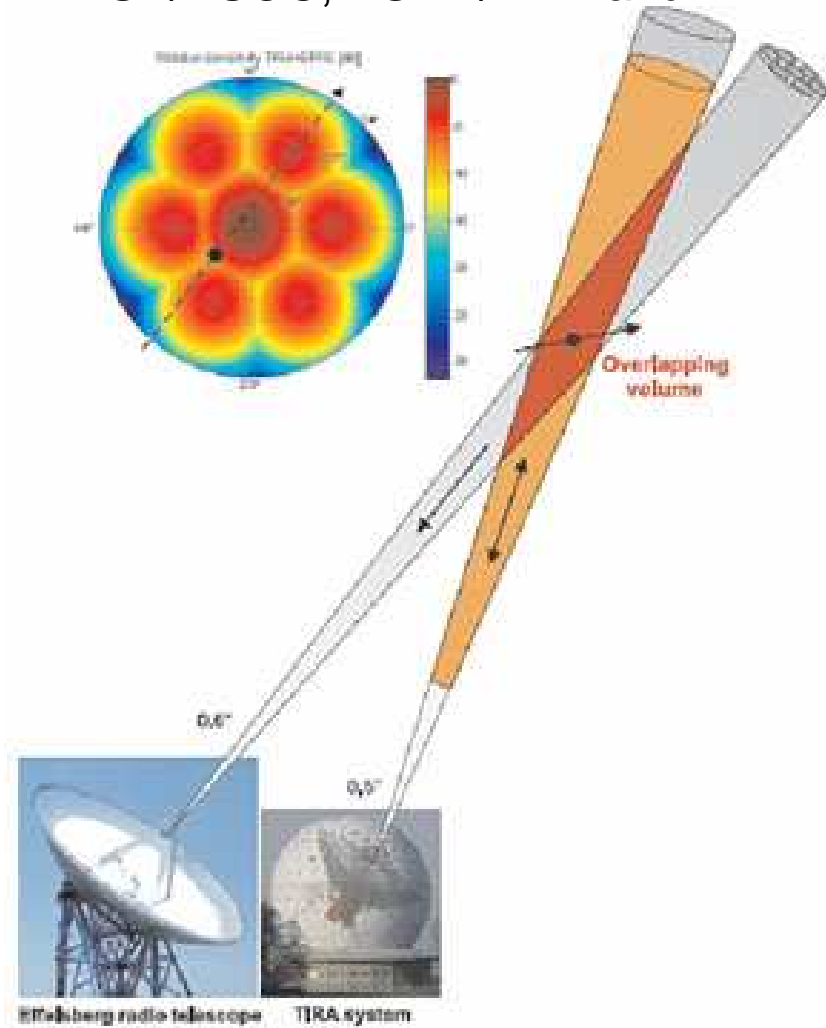
Max-Planck-Institut  
für Radioastronomie



universität  **bonn**

# EBHIS: receiver system

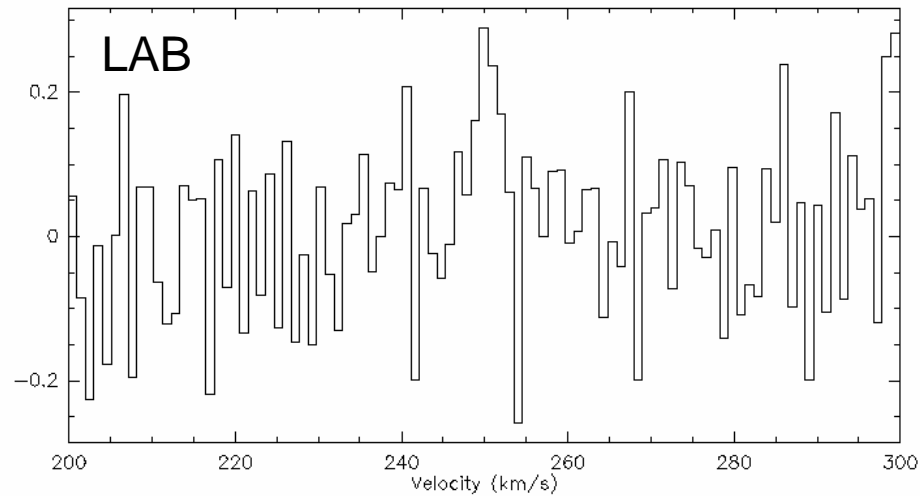
ESA/ESOC, FGAN/FHR and MPIfR



# EBHIS concept

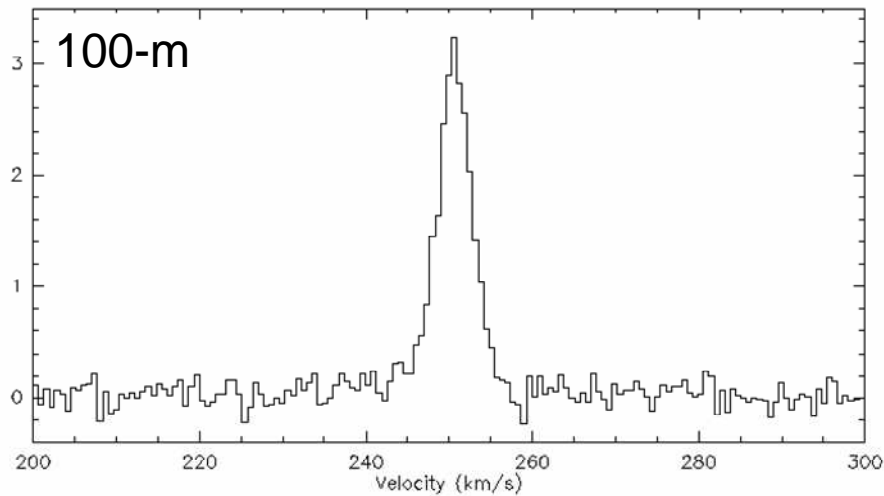
- Galactic and extragalactic HI survey
  - Galactic part
    - High angular resolution → fully sampled grid (3 arcmin separation)
    - High spectral resolution → close to 1  $\text{kms}^{-1}$  CNM
    - High speed dumping → 1 second RFI mitigation
    - Multiple coverages → stray radiation correction

# EBHIS concept



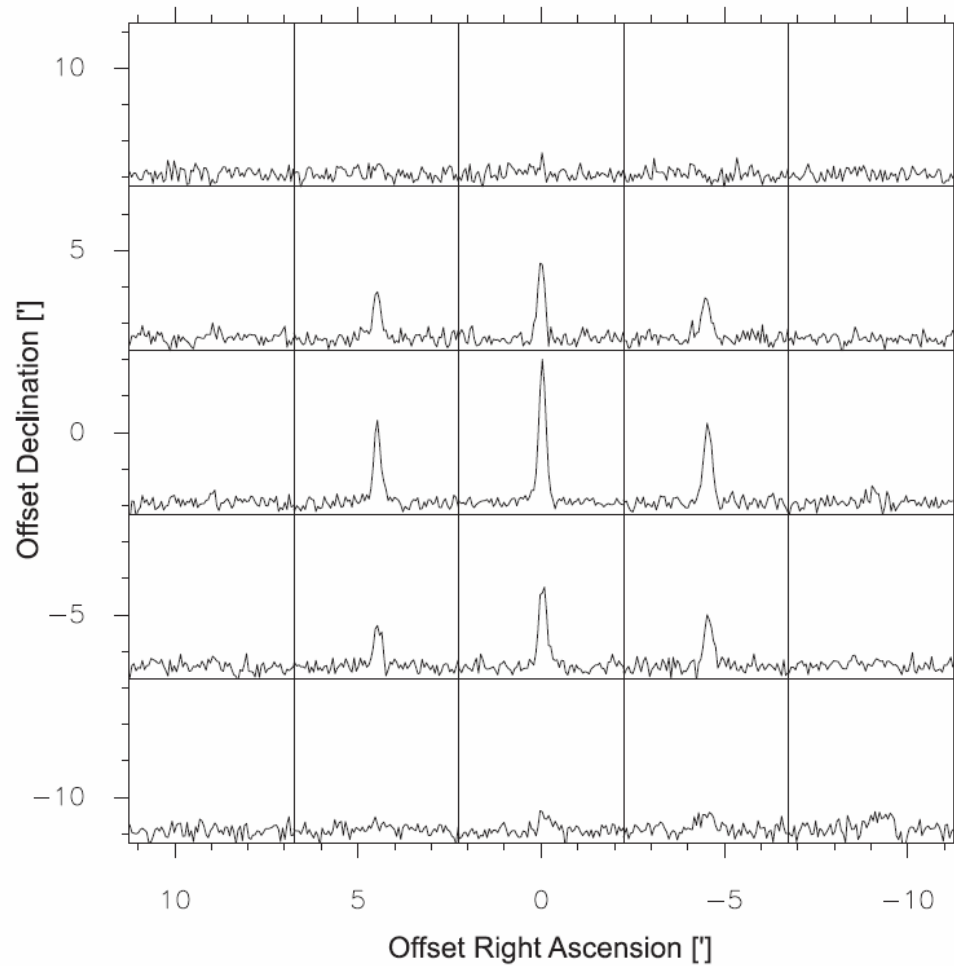
**HVC 289+33+251**

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  $\text{kms}^{-1}$  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)

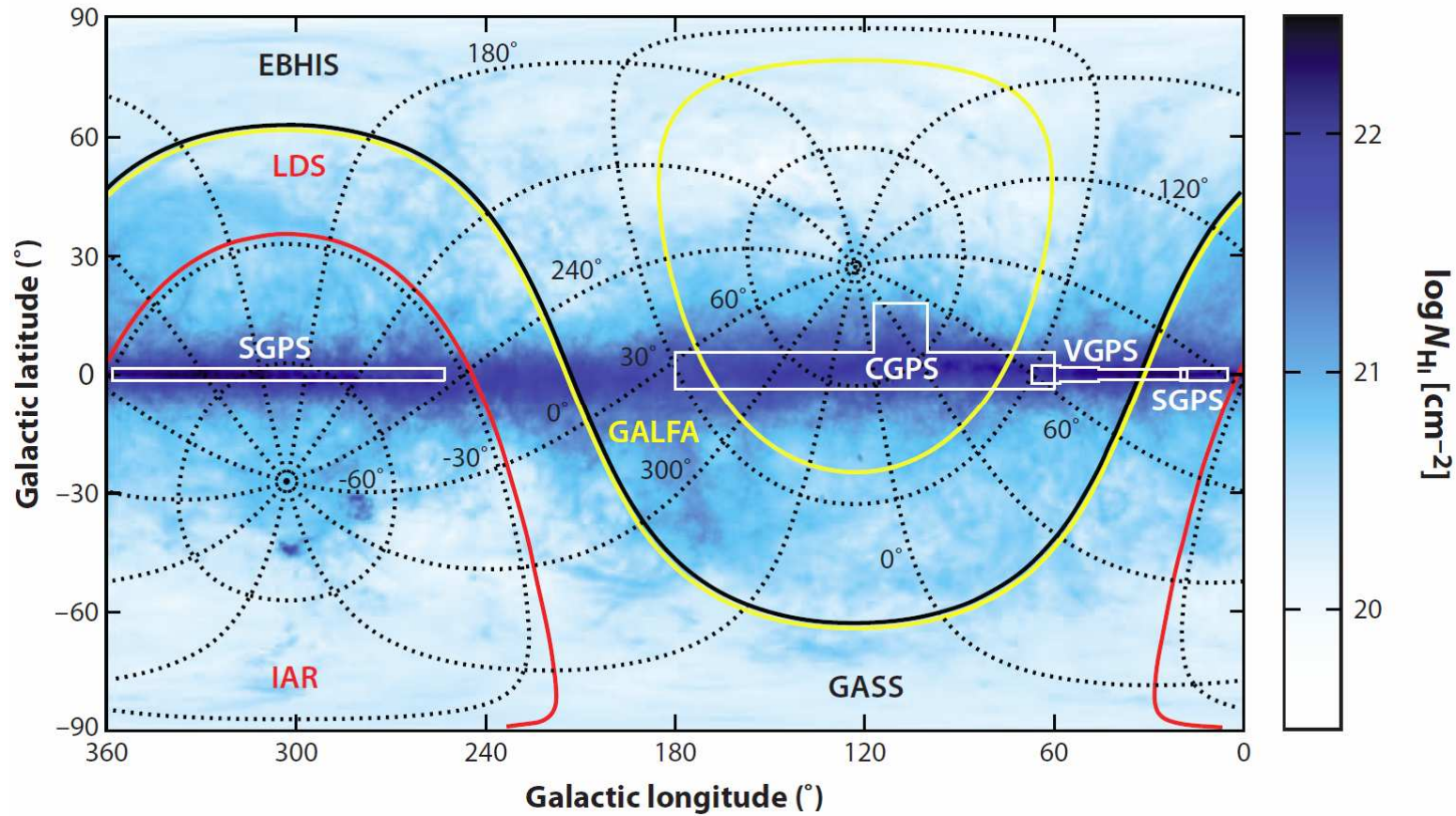
# EBHIS concept

- 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](http://www.astro.uni-bonn.de/~webaiub/english/tools_ebhissurvey.php)

# EBHIS: receiver system

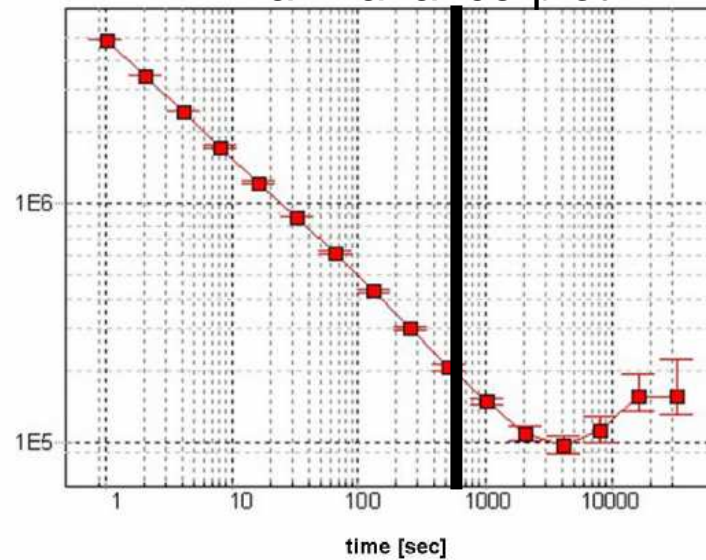
- EBHIS concept
  - Effelsberg 100-m dish seven feed receiver system
    - Offset-feed linear polarisation
    - Central-feed circular polarisation
    - 21 to 24 K system temperature
  - FPGA-Spectrometer
    - 16384 spectral channels
    - Recording of 14 spectral channels
    - 8-bit sampling
   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

# EBHIS setup: FPGA spectrometer

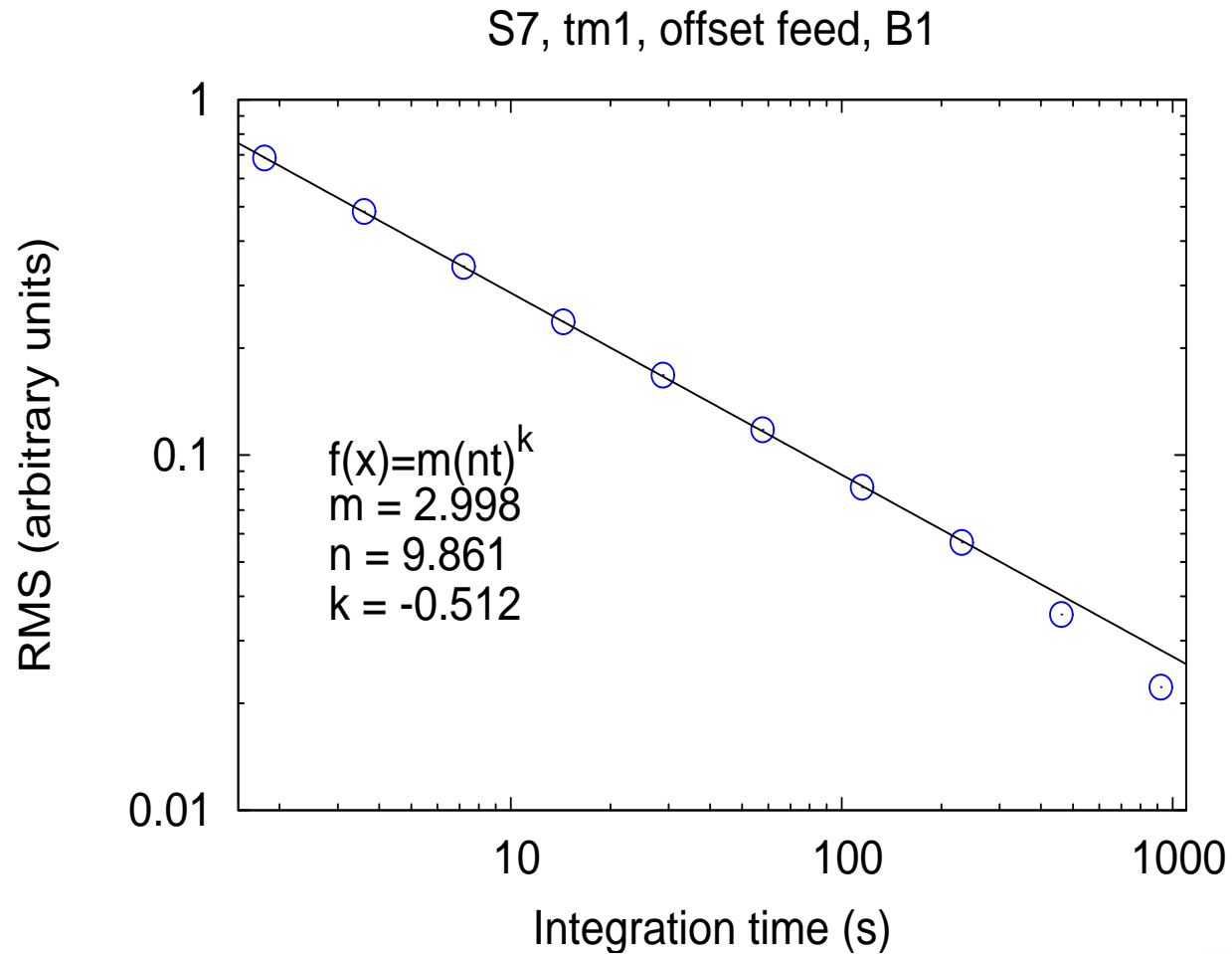


B. Klein (MPIfR)

### Allan variance-plot

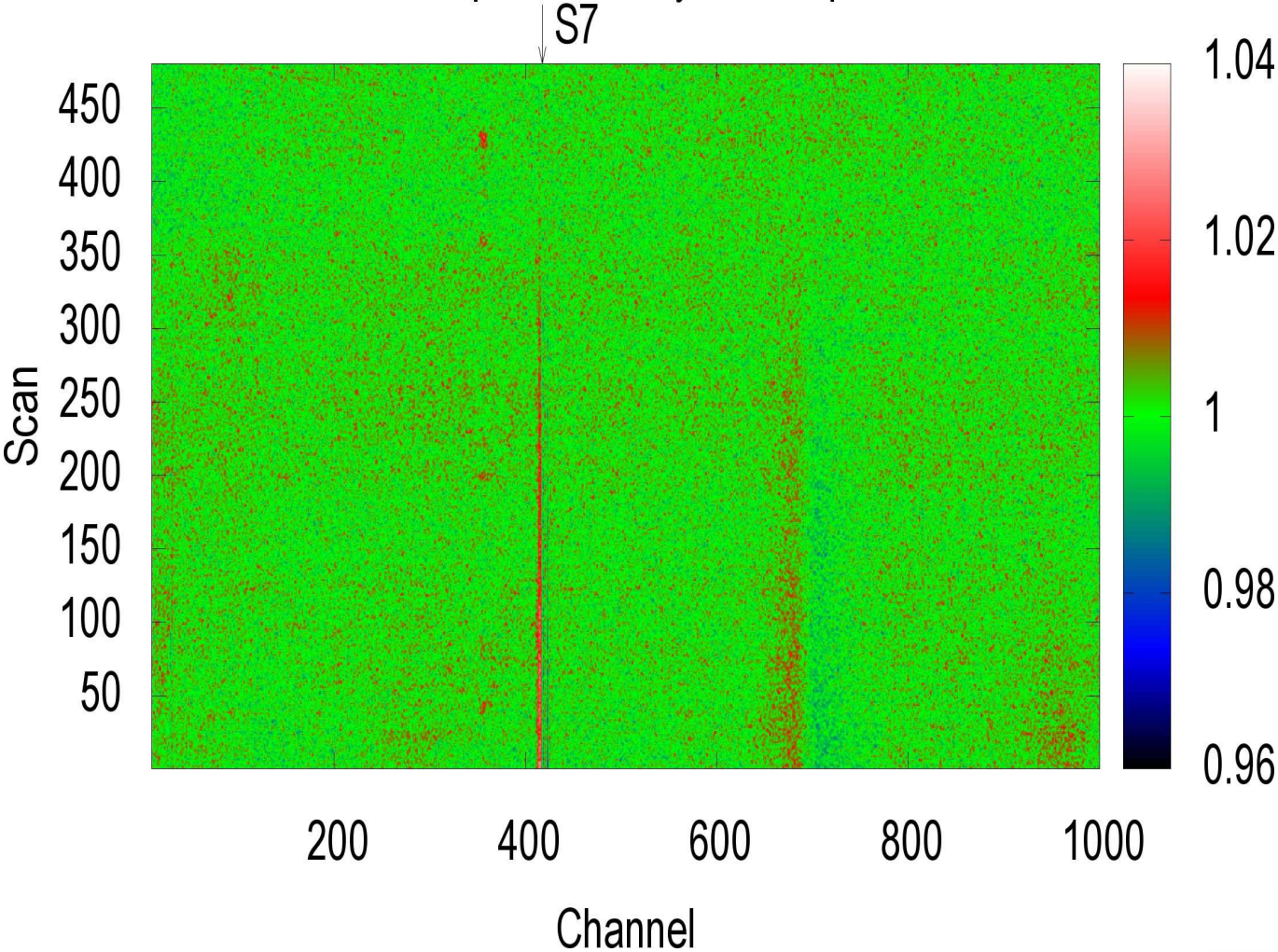


# Current status: receiver performance

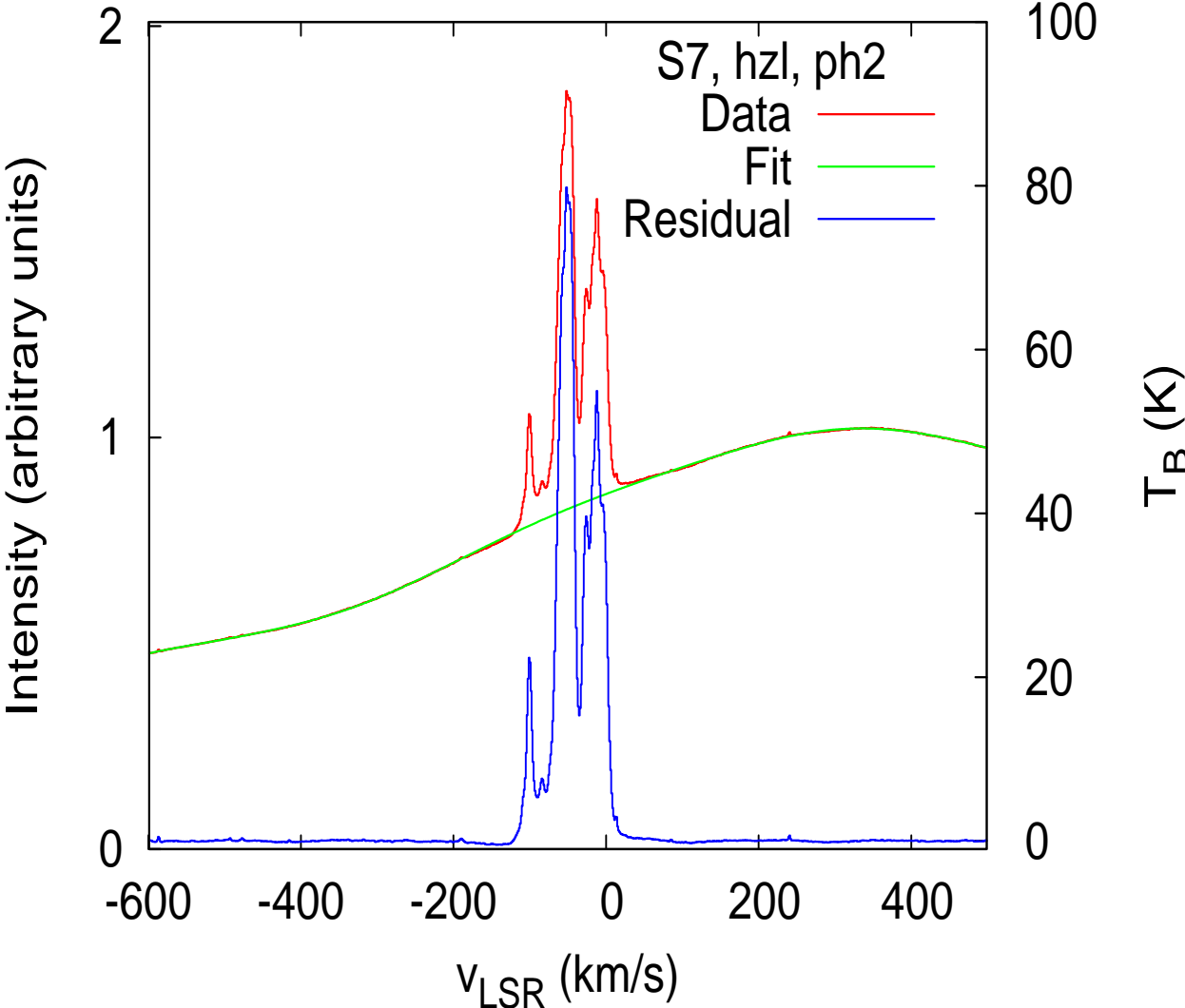


# current status: Milky Way data

0.45 s dumps divided by mean spectrum



# current status: Milky Way data

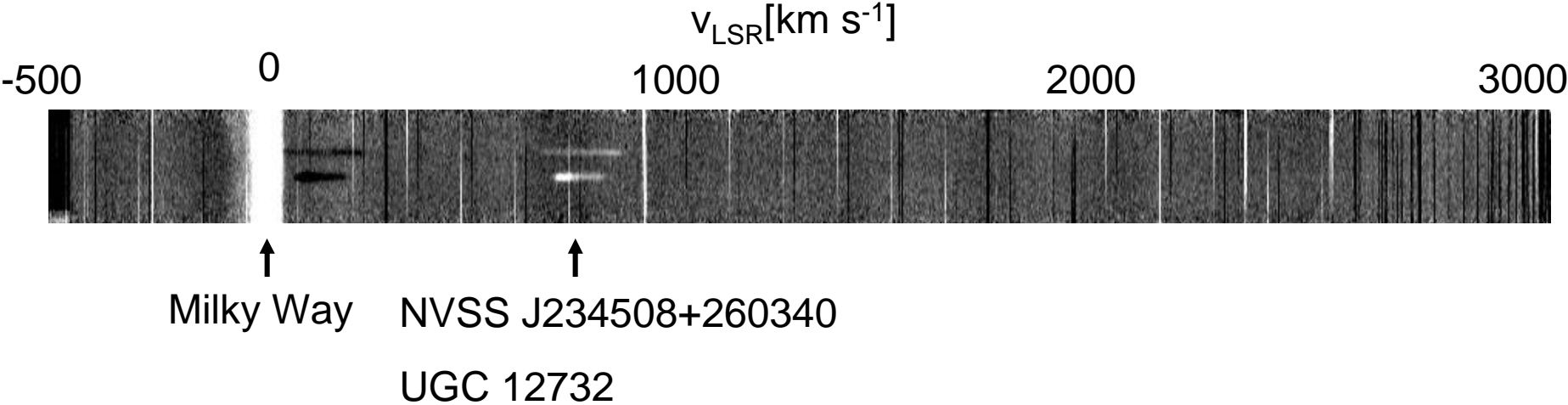


# Current status: performed observations

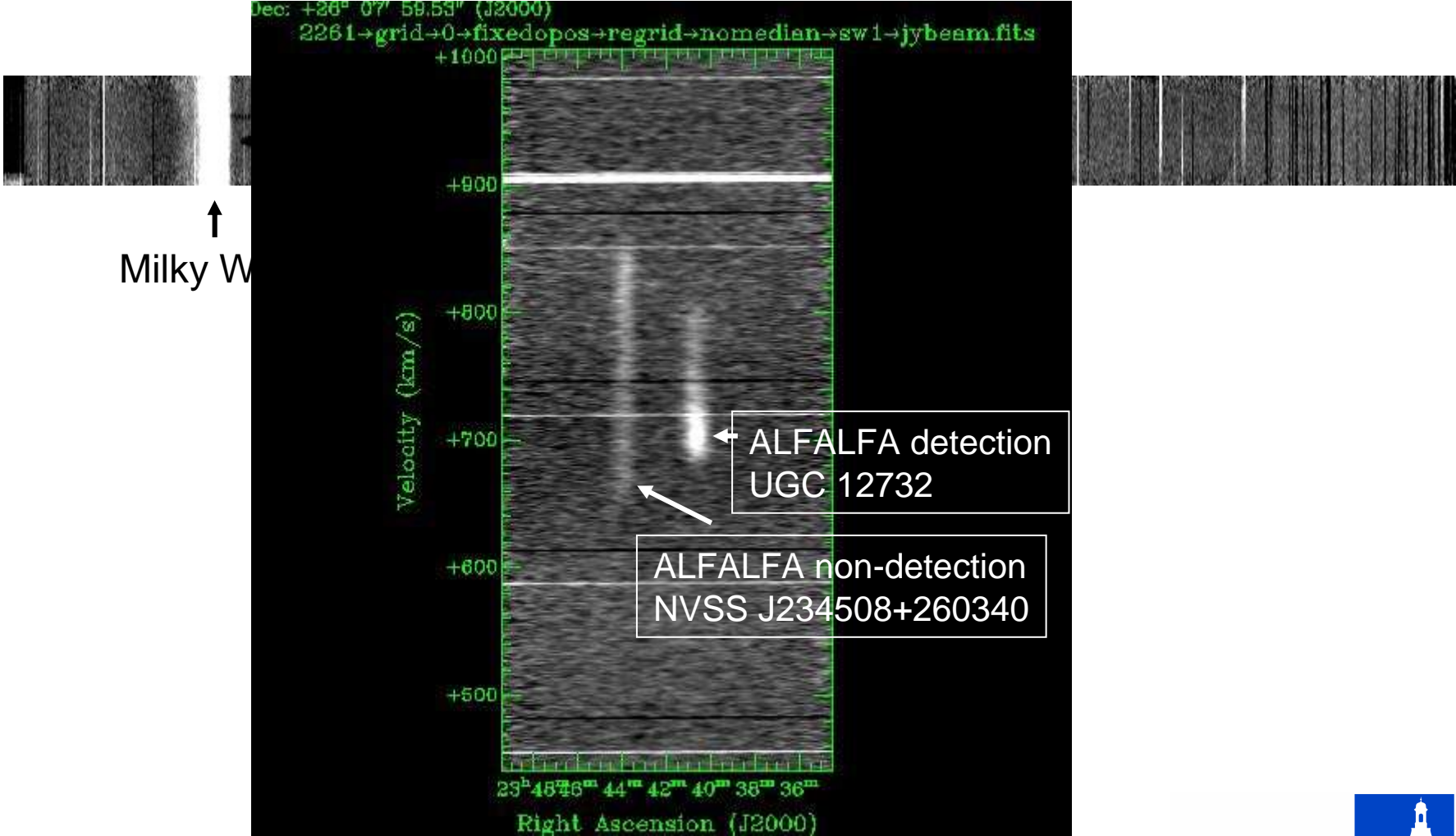
- Project status
  - Approved open time program with initially 600 hours of granted observing time for 2009
  - 200 hours already observed (~1500 sq. Degrees)
    - Selected areas/targeted observation
    - Feasibility checks

- 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

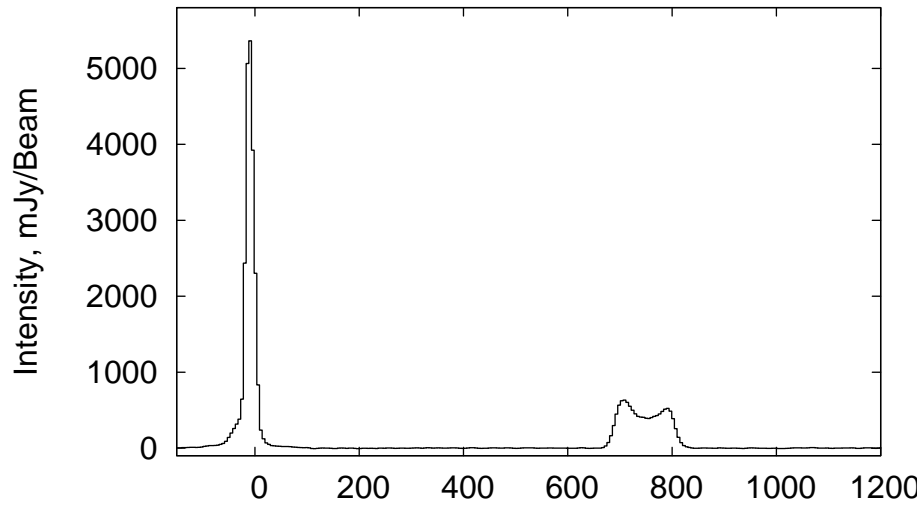


# Current status: extragalactic data

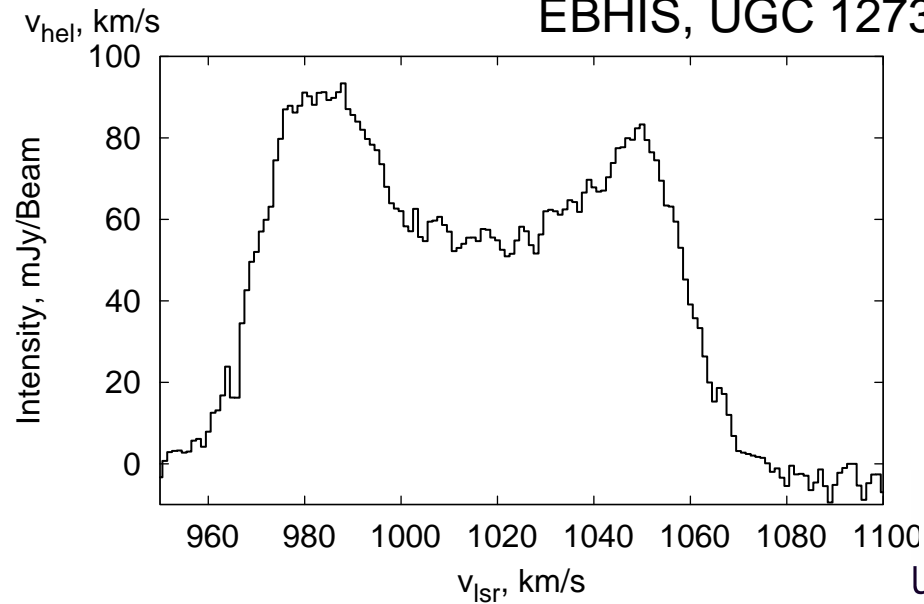


# Current status: extragalactic data

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