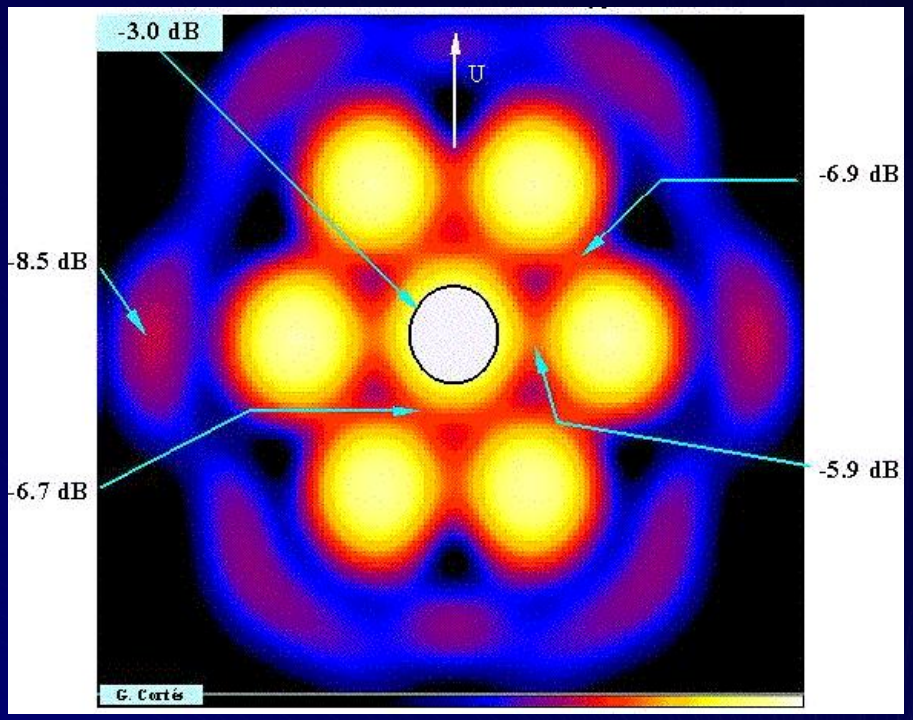
Seeding ALFALFA



Martha Haynes, Cornell University
08.01 ALFALFA Undergraduate Workshop

ALFALFA

ALFALFA is a team effort!

ALFALFA

Seeding ALFALFA

As a legacy project being carried out by a group of university researchers at a NSF funded national center, ALFALFA is and must be a team effort

- Observing at Arecibo* and remotely
- Data reduction and analysis
- Correlative studies with other databases, e.g., SDSS
- Followup observations with other telescopes
- Modeling/simulation of interactions, processes

* A lot more fun; especially recommended in winter

ALFALFA

IDL for ALFALFA "LOVEDATA"

- Processing uses Interactive Data Language = IDL
  - IDL is programming environment
  - Educational/student licenses
  - Astronomy IDL library has general Astro utilities
  - "LOVEDATA" runs on Linux/MacOS
  - Running at Cornell, Arecibo, Lafayette, Colgate, Wesleyan, Union, Indiana, Humboldt State, Georgia Southern, St. Lawrence, George Mason, Colorado, Milano… + more to come!

http://egg.astro.cornell.edu/alfalfa

The Arecibo Legacy Fast ALFA Survey

Main People Science Schedule Data Documentation Links Publications Undergrads
Non-experts News/Events Observing/Data Team

Overview

Arecibo is the world's most sensitive radio telescope at L-band. In addition to that all-important sensitivity advantage, Arecibo equipped with ALFA offers important and significant improvements in angular and spectral resolution over the available major wide area extragalactic HI line surveys such as HIPASS and HIJASS. To break ground into new science areas, extragalactic HI surveys with ALFA must exploit those capabilities to explore larger volumes with greater sensitivity than have the previous surveys. The lowest mass objects will only be detected nearby; wide areal coverage is the most efficient means of increasing the volume sampled locally. An extragalactic survey covering the high galactic latitude sky visible from Arecibo will produce an extensive database of HI spectra that will be of use to a broad community of investigators, including many interested in the correlative mining of multiwavelength datasets; we thus dub this program the ***Arecibo Legacy Fast ALFA*** survey: **ALFALFA**. A comparison of major blind HI surveys and ALFALFA is presented in Table B.1. A 2-pass drift survey will deliver 1.6 mJy/channel sensitivity (at 18 km/s), 8× better than HIPASS and with 4× better angular resolution (FWHM). In addition to its broad applications, such a wide area HI survey will serve as a strategic approach to a number of focussed E-ALFA science objectives. In coordination with this survey, deeper studies of selected regions, some of which await the second generation E-ALFA spectrometer, will address other critical E-ALFA science goals that are not discussed herein.

http://egg.astro.cornell.edu/alfalfa

The Arecibo Legacy Fast ALFA Survey

ALFALFA science projects

The science projects listed here have been proposed by subgroups of the ALFALFA team under the ALFALFA and will become active following with approval of the ALFALFA Oversight Committee.

It is hoped that projects will follow the ALFALFA recommended project guidelines and apply the recommended criteria for authorship.

- ALFALFA team projects
- ALFALFA graduate student projects
- ALFALFA undergraduate student projects

This page maintained by members of the Cornell ExtraGalactic Group.

Last modified: Tue Sep 20 18:55:42 EDT 2005 by martha

ALFALFA

http://egg.astro.cornell.edu/alfalfa

Official ALFALFA Team Projects

ALFALFA is an open science collaboration. It is assumed that all projects undertaken as part of the collaboration will adopt the general ALFALFA recommended project guidelines and the recommended criteria for authorship.

The projects listed here have been submitted to and approved by the ALFALFA Oversight Committee.

Team projects

Title	Team leader	Timeframe	Project Summary
Blended HI signals from distant clusters	Lyle Hoffman	Long term	Summary
An H-alpha Imaging Survey for a Volume-Limited Sample of ALFALFA Sources	John Salzer	Long term	Summary
Synthesis Imaging of Low Mass Dwarfs discovered by ALFALFA	Ayesha Begum	Long term	(Coming)
Integrated Spectra of galaxies detected by ALFALFA	Alessandro Boselli	Long term	(Coming)
H-alpha Imaging of ALFALFA Galaxies in Selected Cluster Fields	Peppo Gavazzi	Long term	(Coming)
ALFALFA survey of the region around ZwCL1400+0949	Tom Balonek	AY2006-7	(Coming)

Graduate student PhD (i.e major) projects

Project title	Student	Institution	Context	Adviser	Timeframe	Project Summary
Chemical abundances of low mass galaxies	Amélie Saintonge	Cornell	Part of PhD thesis	Riccardo Giovanelli	2007	Summary
First epoch ALFALFA Virgo cluster survey	Brian Kent	Cornell	Part of PhD thesis	Riccardo Giovanelli	2008	Summary
Cross-correlation of ALFALFA HI detections with SMUDGES objects	Prasanth Nair	Indiana U.	Part of PhD thesis	Liese van Zee	2008	Summary

ALFALFA

http://egg.astro.cornell.edu/alfalfa

Official ALFALFA Student Projects

Projects designated herein will be given priority by the observing team and in general by the ALFALFA team overall to insure their timely completion and success. At the same time, they should also apply the general ALFALFA recommended project guidelines and the recommended criteria for authorship.

Student	Institution	Context	Adviser	Timeframe	Title/Abstract
Adeel Altaf	Lafayette '06	Senior thesis	Lyle Hoffman	AY05-06	Summary
Brian Walsh	Colgate '06	Senior research project	Tom Balonek	AY05-06	Summary
Amy Furniss & Arik Mitschang	Humboldt State '06	Senior research projects	Dave Kornreich	CY06	Summary

The Undergraduate Project Template
Back to the projects page
Back to the main ALFALFA page

http://egg.astro.cornell.edu/alfalfa

The Arecibo Legacy Fast ALFA Survey

Main People Science Schedule Data Documentation Links Publications Undergrads
Non-experts News/Events Observing/Data Team

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http://egg.astro.cornell.edu/alfalfa

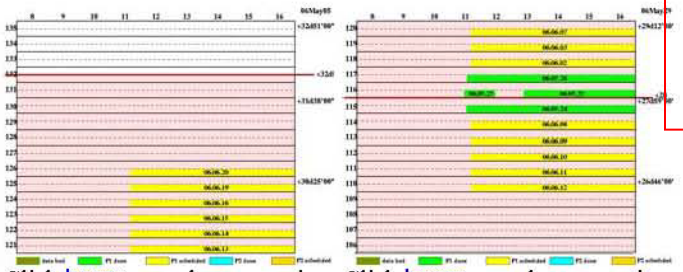
- **ALFALFA Spring Semester 2006: Planned Observations**

Observations in the R.A. range from 07^h30^m to 16^h30^m in Spring 2005 focused on the tiles centered at +10 and +14 degrees. In spring 2006, we are completing these tiles as well as the one at +06 degrees; we may also try to start the one at +30 degrees.

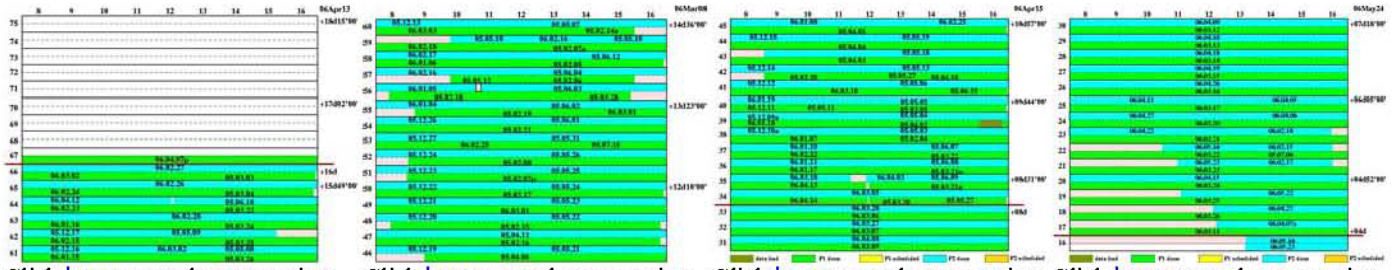
The graphical summaries below indicate the A2010 coverage during the spring 2006 observing season.

Yellow indicates planned observations in pass 1.
Green indicates completed observations in pass 1.
Gold indicates planned observations in pass 2.
Cyan indicates completed observations in pass 2.
Brown indicates poor quality data (hardware failure, gain instability or unusual rfi)
Pink indicates the area to be covered next (may be started but not completed in 2006)

Keep track of what ALFALFA will/has/is cover/ed/ing



Click here to see larger version. Click here to see larger version.



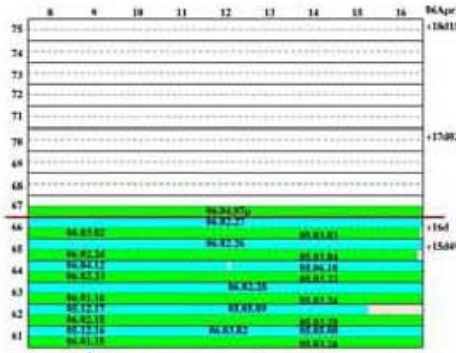
Click here to see larger version. Click here to see larger version. Click here to see larger version. Click here to see larger version.

ALFALFA

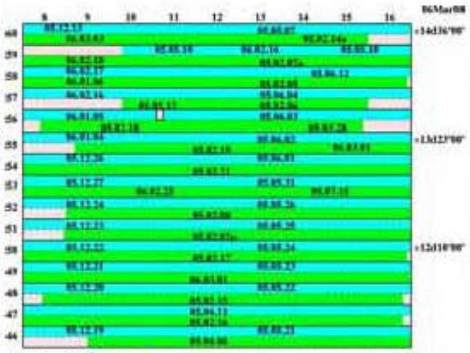
http://egg.astro.cornell.edu/alfalfa

Click here to see larger version.

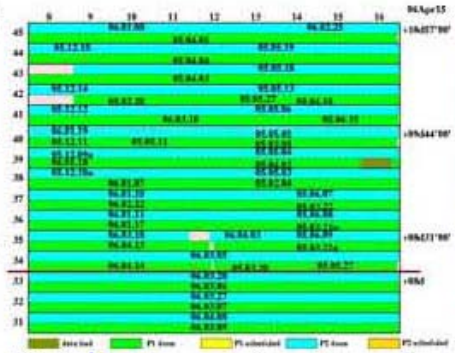
Click here to see larger version.



Click here to see larger version.



Click here to see larger version.



Click here to see larger version.

Click here to see larger version.

ALFALFA

http://caborojo.astro.cornell.edu/alfalfalog

ALFALFA Team Website http://caborojo.astro.cornell.edu/alfalfalog/index.php

(Access Restricted to Authorized ALFALFA Users!)

User Name Ask us

Password Ask us

Login

Return to the main ALFALFA Page

ALFALFA

http://caborojo.astro.cornell.edu/alfalfalog

- Raw data:
  - archived at Arecibo
- Level I: 2-D
  - processing can be exported
  - archived at Cornell
- Level II: Gridded cubes
  - processing can be exported
  - archived at Cornell
  - access through VO (eventually)

Current dataset ~ 5TB

ALFALFA

A2010 Official Data Archive **Organized by Block**

See also the versions organized by declination: Spring archive Fall archive

Green boxes indicate data that has not yet been flagged.
Olive boxes indicate bad/no data that might as well be discarded so don't bother to flag.

Disk area	Contents
AO:/sh/a2010	Raw IDL files only at AO:/share/a2010/data
AO:/a2010-2	Raw IDL files only at AO:/share/a2010-2/data
/home/dorado13/galaxy/idlraw	Raw IDL files - current
/home/dorado10/galaxy/flagbb	Flagged data
/home/dorado11/galaxy/flagbb	Flagged data
/home/dorado12/galaxy/flagbb	Flagged data
/home/toro2/galaxy/flagbb	Flagged data

Backup Records

Log	Date	Contents
Summary	06Feb05	/home/dor10/flagbb
Summary	06Feb05	/home/dor11/flagbb
Summary	06Feb05	/home/dor12/flagbb
Summary	06May13	/home/toro2/flagbb

Current position file listing for use with posfind.pro can be found here. Contains only Level I data sets in their correct home! Updated by bkent.

February 2005

Block	DecJ	RA	Raw files disk	Level I	Who	#	QA	Backup	Notes
05.02.04	38p1 +090730	1249-1633	are2/idlraw	dor11/flagbb	rg	23	2.0	06Feb05	
05.02.05	58p1 +135930	1123-1536	are2/idlraw	dor11/flagbb	rg	25	1.2	06Feb05	
05.02.06	57p1 +134454	1122-1535	are2/idlraw	dor11/flagbb	rg	25	1.7	06Feb05	first 8 scans poor, good after wards
05.02.07a	59p1 +141406	1116-1640	are2/idlraw	dor11/flagbb	rg	32	1.9	06Feb05	
05.02.07p	51p1 +121718	0826-1642	are2/idlraw	dor11/flagbb	rg	49	1.3	06Feb05	

ALFALFA

http://caborojo.astro.cornell.edu/alfalfalog

ALFALFA

A2010 Official Data Archive Spring Sky Drifts

See the version organized by observing block See the Fall archive

Green boxes indicate data that has not yet been flagged.
Olive boxes indicate bad/no data that might as well be discarded so don't bother to flag.

Disclaimer: This file may not be as up-to-date as the listing by observing block!

DecJ	Block	RA	Raw files disk	Level I	Who	#	QA	Backup	Notes
Begin +06deg tile									
17p1 +040054	06.03.11	0724-1651	dor13/idlraw	toro2/flagbb	lh	56			
17p2 +040812	06.04.07a	1215-1648	dor13/idlraw						
18p1 +041530	06.03.26	0726-1657	dor13/idlraw						WAPPgap 0917-0922; 2 cals
18p2 +042248	06.04.27	1215-1638	dor13/idlraw						
19p1 +043006	06.03.25	0719-1645	dor13/idlraw						
20p1 +044442	06.03.24	0711-1648	dor13/idlraw		(mh)				
20p2 +045200	06.04.15	0715-1722	dor13/idlraw		(mh)				power dip; extra time
21p1 +045918	06.03.23	0718-1644	dor13/idlraw	toro2/flagbb	am	55			
21p2 +050636	06.02.17	1308-1550	AO:a2010-2	toro2/flagbb	mh	49			2 decs; some HVC/or/rfi?
22p1 +051354	06.03.22	0720-1656	dor13/idlraw		(mh)				FITS pos errs fixed!
	05.07.06	1331-1502	AO:a2010-2	dor12/flagbb					A2140: Union Ugrad workshop
22p2 +052112	06.02.15	1305-1557	dor13/idlraw	toro2/flagbb	sb	18			2 decs; WAPP gap 1222-1232 2 cal periods in 62p1
23p1 +052830	06.03.21	0715-1651	dor13/idlraw		(mh)				
23p2 +053548	06.04.22	0732-1347	dor13/idlraw		(mh)				
	06.02.18	1313-1554	dor13/idlraw	toro2/flagbb	af	49			2 decs
24p1 +054306	06.03.20	0711-1627	dor13/idlraw	toro2/flagbb	am	55			
24p2 +055024	06.04.27	0710-1213	dor13/idlraw						
	06.04.06	1208-1641	dor13/idlraw		(mh)				
25p1 +055742	06.03.17	0721-1627	dor13/idlraw	toro2/flagbb	bk	54			BK flag, LH bpdgui
25p2 +060500	06.04.11	0713-1337	dor13/idlraw						
	06.04.05	1223-1646	dor13/idlraw		(mh)				
26p1 +061218	06.03.16	0729-1635	dor13/idlraw	toro2/flagbb	am	54			AM flag, LH bpdgui
26p2 +061936	06.04.26	0727-1633	dor13/idlraw		(mh)				
27p1 +062654	06.03.15	0720-1636	dor13/idlraw	toro2/flagbb	am	55			AM flag, LH bpdgui
27p2 +063412	06.04.19	0708-1645	dor13/idlraw		(mh)				ALFA cooling
28p1 +064130	06.03.14	0719-1645	dor13/idlraw	toro2/flagbb	bk	56			LH start, BK finished
28p2 +064848	06.04.18	0727-1654	dor13/idlraw	toro2/flagbb	mh	55			ALFA refrig failure
29p1 +065606	06.03.13	0721-1637	dor13/idlraw	toro2/flagbb	lh	55			
29p2 +070324	06.04.10	0723-1649	dor13/idlraw	toro2/flagbb	mh	56			
30p1 +071042	06.03.12	0726-1643	dor13/idlraw	toro2/flagbb	lh	55			
30p2 +071800	06.04.09	0719-1645	dor13/idlraw						
31p1 +072518	06.03.09	0721-1637	dor13/idlraw	toro2/flagbb	lh	55			
31p2 +073236	06.04.08	0727-1641	dor13/idlraw						
32p1 +073954	06.03.07	0722-1648	dor13/idlraw		(am)				
32p2 +074712	06.03.27	0715-1630	dor13/idlraw						
33p1 +075430	06.03.06	0715-1631	dor13/idlraw		(am)				
33p2 +080148	06.03.28	0715-1631	dor13/idlraw						
Begin +10deg tile									
34p1 +080905	06.04.14	0726-1159	dor13/idlraw						
	05.03.20	1208-1349	are2/idlraw	dor11/flagbb	rg	10	1.1	06Feb05	Run ends early due to WAPP fai lure

ALFALFA

http://caborojo.astro.cornell.edu/alfalfalog

ALFALFA IDL documents

As in everything associated with this website: YOU GET WHAT YOU PAY FOR!

1. Check with RG or BK to see if these are still valid;
2. Don't expect perfection; and
3. Some people deserve a lot of thanks for their efforts!

- IDL Procedures
- Instructions on Level I processing
- Instructions on running the 2-D signal extractor
- Instructions on running the 3-D signal extractor
- Instructions on processing grids
- File naming conventions
- Download the code

This page maintained by members of the Cornell ExtraGalactic Group.

http://www.naic.edu/~a2010/galaxy_a2010.html

ALFALFA

On-site ALFALFA links for project A2010

- The ALFALFA web page at Cornell
- The master list of ALFALFA declination drift assignments
- The current block allocation summary (recent past as well as near future)
- The block allocation summary for near future

- A2010 Observing cookbook
- A2010 Observing checklist
- A2010 Remote Observing checklist
- Task assignment checklist
- Quick list of things to do at the end of observing block
- Observational Troubleshooting
- TOGS instructions (from the TOGS team)
- TOGS contact list

- Observing logs, cimalogs, FITSfilelogs

- AO telescope schedules
- CIMA users log file (Check for changes to CIMA made recently)

- Spring 2006 observations (Current, more or less!)
  - Graphical schedule Spring Drifts 121-135
  - Graphical schedule Spring Drifts 106-120
  - Graphical schedule Spring Drifts 91-105

  - Graphical schedule Spring Drifts 61-75
  - Graphical schedule Spring Drifts 46-60
  - Graphical schedule Spring Drifts 31-45
  - Graphical schedule Spring Drifts 16-30
  - Quick summary of "Spring" drift status
  - Quick summary of "Spring" drift needed to complete 2006 target region
- Fall 2005 observations
  - Block allocation summary for Fall 2005 (completed)
  - Graphical schedule Fall Drifts 121-135
  - Graphical schedule Fall Drifts 106-120
  - Graphical schedule Fall Drifts 91-105
  - Quick summary of "Fall" drift status
- Spring 2005 observations
  - Block allocation summary for Spring 2005 (completed)
  - Graphical schedule Spring Drifts 61-75
  - Graphical schedule Spring Drifts 46-60
  - Graphical schedule Spring Drifts 31-45
  - Quick summary of "Spring" drift status

Arecibo project A2010

- Observing information
- Observing plans and logs
- Observing cookbooks,
- Graphical schedules
- Reduction cookbookds
- Links to documentation

http://www.naic.edu/~a2010/galaxy_a2010.html

Block	A2010 observing log	Cima log	Scan list	Comment
06.05.26	log060526	cimalog	fitsfiles	TOGS run at start and end. A2010 all okay.
06.05.25	log060525	cimalog	fitsfiles	TOGS run at start only. Network failed, obs. completed at AO until end of night; calibration will need to be split. See log for details.
06.05.24	log060524	cimalog	fitsfiles	TOGS run at start and end. A2010 okay.
06.05.23	log060523	cimalog	fitsfiles	2 decs tonight. TOGS run at start and end. A2010 okay, late start by a couple of minutes.
06.05.22	log060522	cimalog	fitsfiles	TOGS run at start only. A2010 okay.
06.05.16	log060516	cimalog	fitsfiles	Run split between two decs - calibration will have to be split. TOGS run at start and end. A2010 fine.
06.04.27	log060427	cimalog	fitsfiles	Run split between two decs - calibration will have to be split. TOGS run at start and end. All a2010 ok.
06.04.26	log060426	cimalog	fitsfiles	Unable to run TOGS at start. No TOGS scheduled at end.
06.04.22	log060422	cimalog	fitsfiles	No TOGS. Note cryo problem (See Phil's page). Smooth run tonight.
06.04.19	log060419	cimalog	fitsfiles	TOGS at start & end. ALFA refrigeration problem discussed on Phil's page.
06.04.18	log060418	cimalog	fitsfiles	TOGS at start & end. Power dip; ALFA refrigerator failed; Tsys rising
06.04.15	log060415	cimalog	fitsfiles	Power dip at 0155AST. TOGS at start and end. Extra time due to R2184 cancellation.
06.04.14	log060414	cimalog	fitsfiles	TOGS at start. a2010 OK.
06.04.13	log060413	cimalog	fitsfiles	TOGS at start. a2010 OK.
06.04.12	log060412	cimalog	fitsfiles	TOGS at start. a2010 OK.
06.04.11	log060411	cimalog	fitsfiles	TOGS at start. a2010 OK.
06.04.10	log060410	cimalog	fitsfiles	TOGS at start and end. a2010 OK.
06.04.09	log060409	cimalog	fitsfiles	TOGS at start and end. a2010 OK.

Links to observing logs updated daily by observer

ALFALFA

http://www.naic.edu/~a2010/galaxy_a2010.html

A2010 Observation Logs

- Spring 2006 logs & links
- Fall 2005 logs & links
- Spring 2005 logs & links

SPRING 2006

Block	A2010 observing log	Cima log	Scan list	Comment
06.07.12	log060622	cimalog	fitsfiles	WAPP failure; 2 cal periods; Union'06 workshop!

ALFALFA is an active, on-going observing program
Everything in science doesn't always work!
BORING IS GOOD!

ALFALFA

http://cosmos.iasf-milano.inaf.it/alfalfa_wiki/

AlfalfaFrontPage - Alfalfa Wiki - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

Back Forward Reload Stop Home http://cosmos.iasf-milano.inaf.it/alfalfa_wiki/AlfalfaFrontPage Go

User Record Viewer

ALFALFA

Martha Haynes | UserPreferences Titles Text

ALFALFA Wiki

IDLALFALFA » UserPreferences » FollowupObservations » LoveData »

AlfalfaFrontPage | RecentChanges | FindPage | HelpContents

Edit Show Changes Get Info Subscribe More Actions:

AlfalfaFrontPage

ALFALFA Wiki

What is this wiki about?

A place for the people involved with the ALFALFA survey to exchange informations about the survey development. See the ALFALFA Web Pages for all the details about the survey.

Please note that this is not a public Wiki. Only people involved with the project are authorized to edit these pages !!! If you are not listed in the AlfalfaGroup page but you are involved with the survey and would like to have access to the Wiki, please contact either Martha Haynes or Riccardo Giovanelli (see the AdminGroup page).

ALFALFA Wiki main topics

- FollowupIdeas: ALFALFA follow-up ideas and discussions
- FollowupObservations: ALFALFA follow-up **Ongoing projects**
- LoveData: Discussion/exchange page for developers/users of IDL_ALFALFA

Interesting starting points:

- RecentChanges: see where people are currently working
- WikiSandBox: feel free to change this page and experiment with editing
- FindPage: search or browse the database in various ways
- SyntaxReference: quick access to wiki syntax
- SiteNavigation: get an overview over this site and what it contains

Done

ALFALFA

http://cosmos.iasf-milano.inaf.it/alfalfa_wiki/

Clear message

Edit Show Changes Get Info Unsubscribe More Actions:

LoveData

LoveData (Love Your Data)

This page is intended to enable communications among the developers and users of the software developed for the processing and analysis of ALFALFA data.

In particular, we will post here various items of interest to others. Please help us by contributing to the knowledge/experience base of ALFALFA.

(a) Put here known problems with installing IDL_ALFALFA on various platforms.
(b) Put here known bugs/"features". If it can be fixed, it might be!
(c) Post suggestions/wishes for improvements. We'll do what we can to accomodate, but unfortunately, we are mortal (well, at least some of us are).
(d) Post here items for discussion by the group.

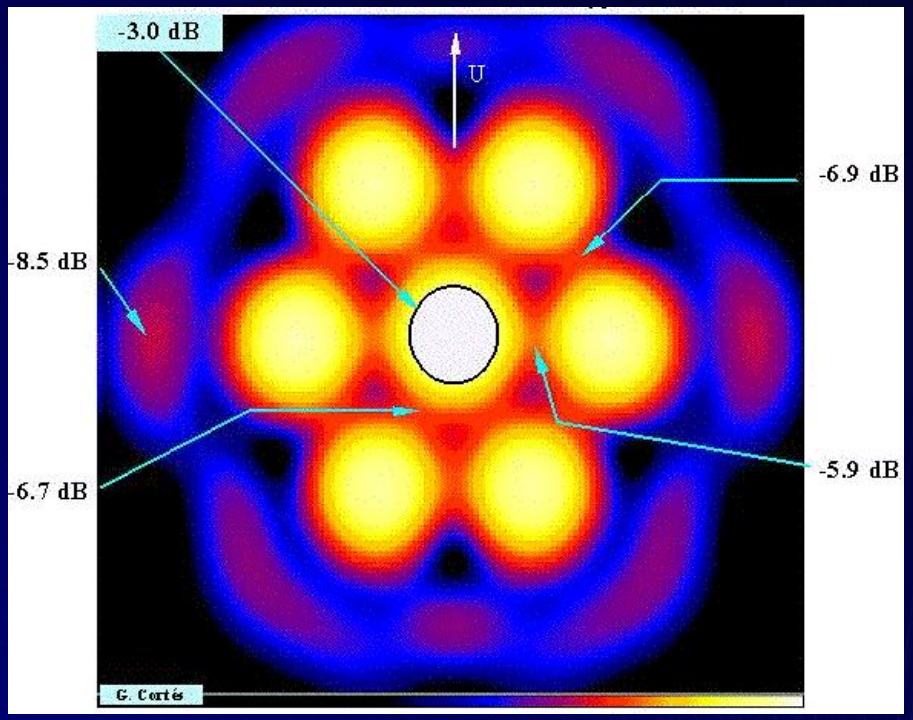
IDL ALFALFA Update

Latest Release
The ALFALFA IDL procedures were last updated June 15, 2006. Email BrianKent if you encounter any problems or have any suggestions.

Edit Show Changes Get Info Unsubscribe More Actions:

ALFALFA

Using ALFA for ALFALFA



Martha Haynes, Cornell University

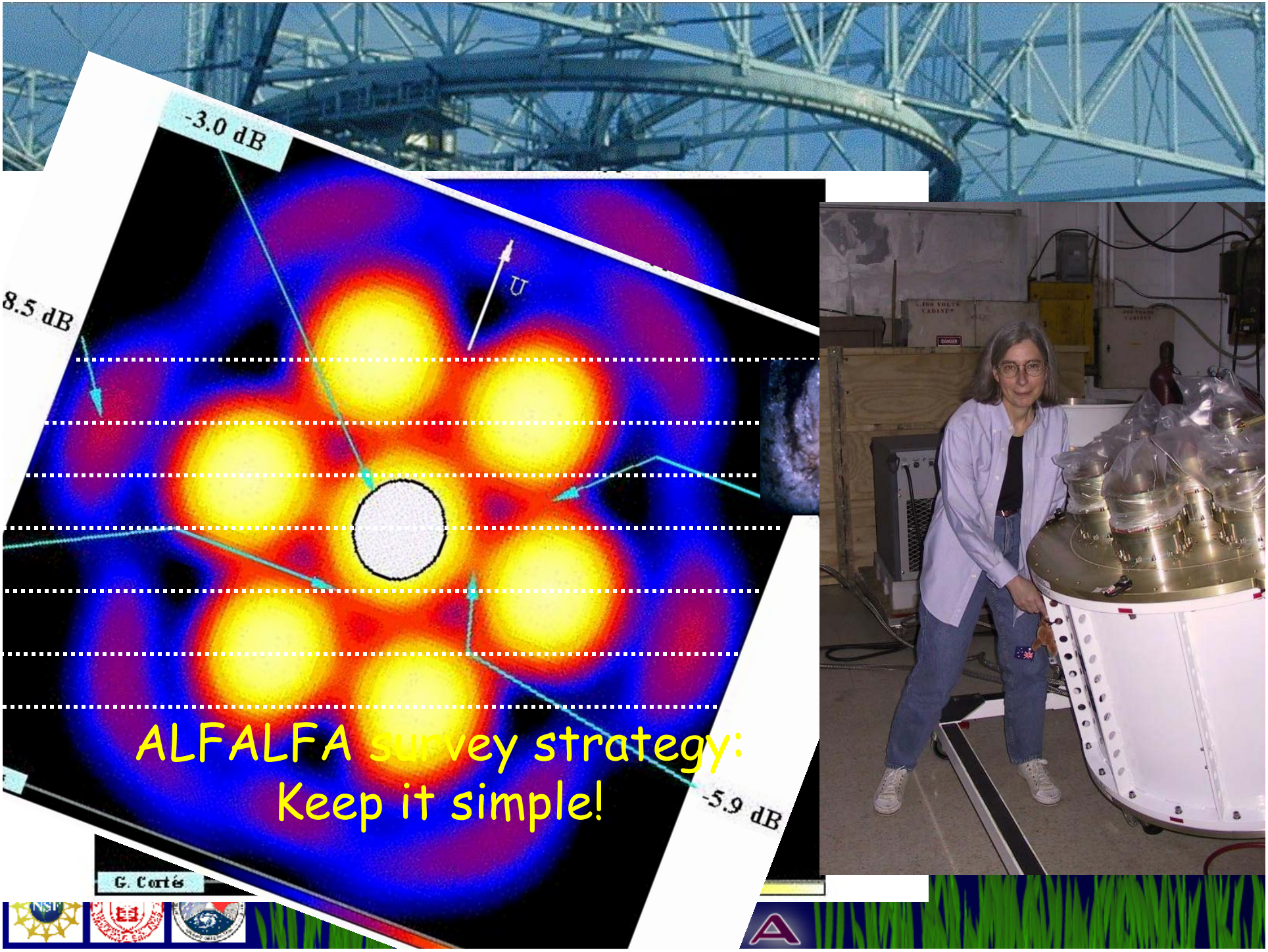
08.01 ALFALFA Undergraduate Workshop

ALFALFA

It is a radio "camera"

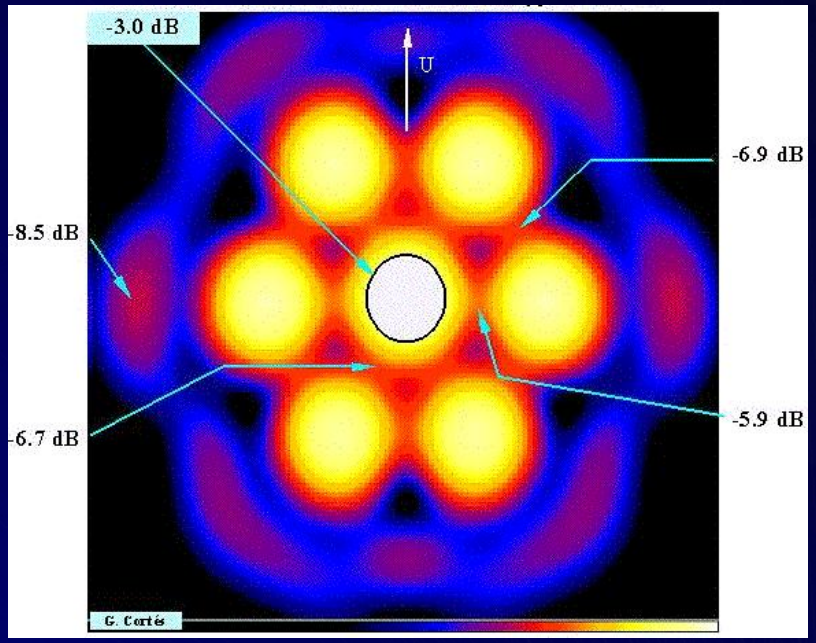
Arecibo L-band Feed Array

ALFALFA



ALFALFA survey strategy: Keep it simple!

ALFA as a Camera



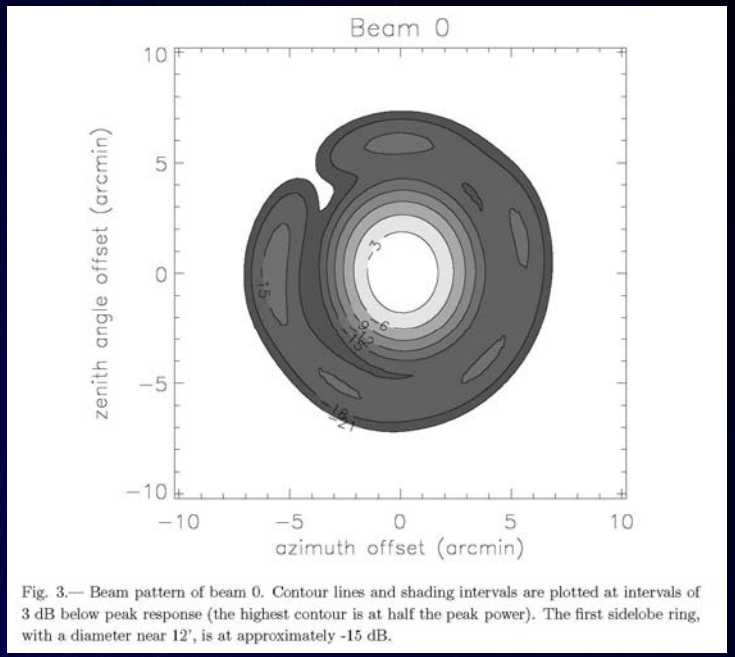
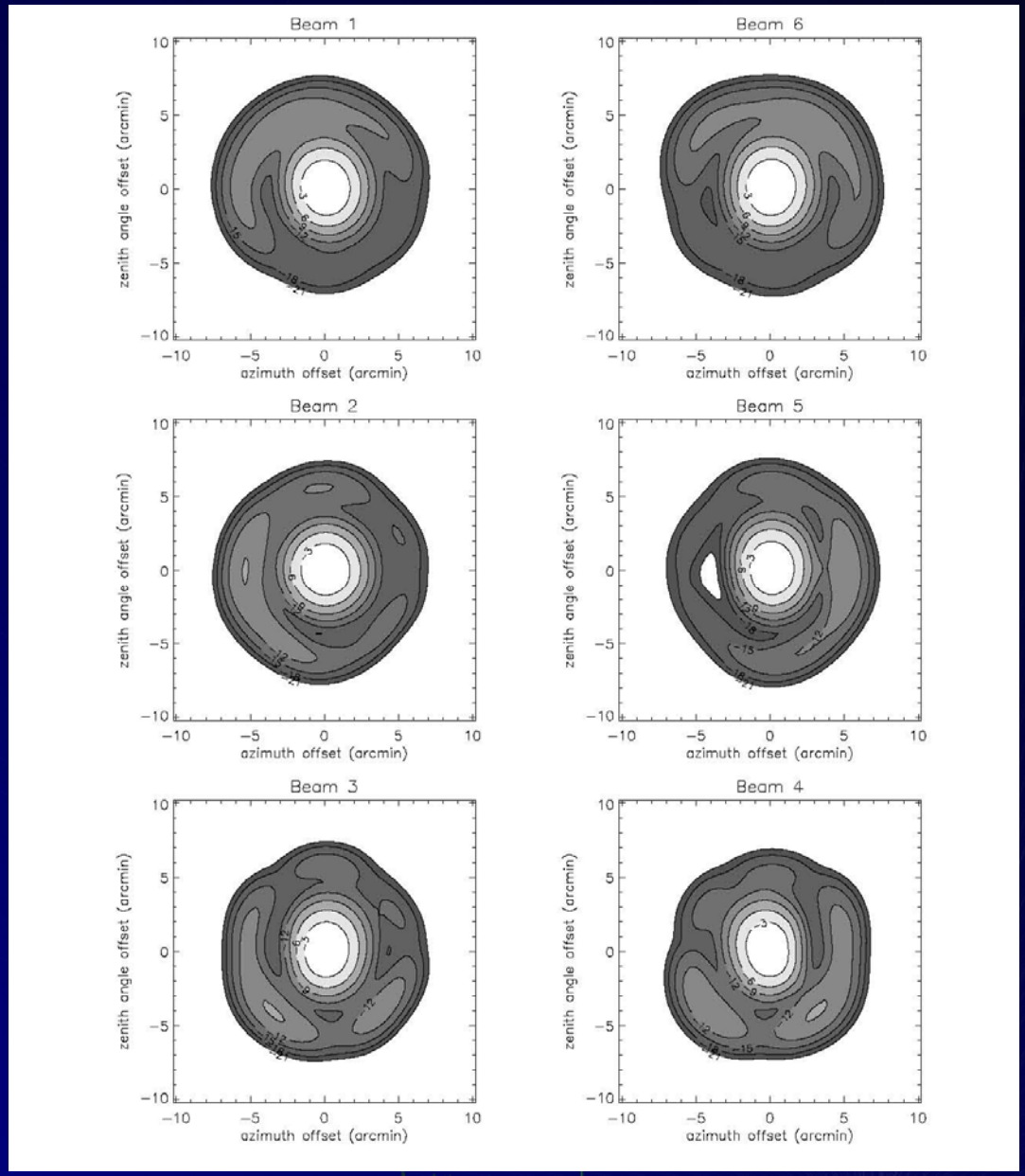


Fig. 3.— Beam pattern of beam 0. Contour lines and shading intervals are plotted at intervals of 3 dB below peak response (the highest contour is at half the peak power). The first sidelobe ring, with a diameter near 12', is at approximately -15 dB.

- The central pixel is more sensitive than the outer ones.
- The beams are really a bit elongated (ignore that for now!)
- The whole array can be rotated around the central beam
- Each beam has sidelobes; they differ from beam to beam.

ALFALFA



Outer beams

Notice that the sidelobe ring is asymmetric and always appears on the side opposite the central pixel.

<u>Bottom line</u>:
We need to be wary of sidelobe contamination!

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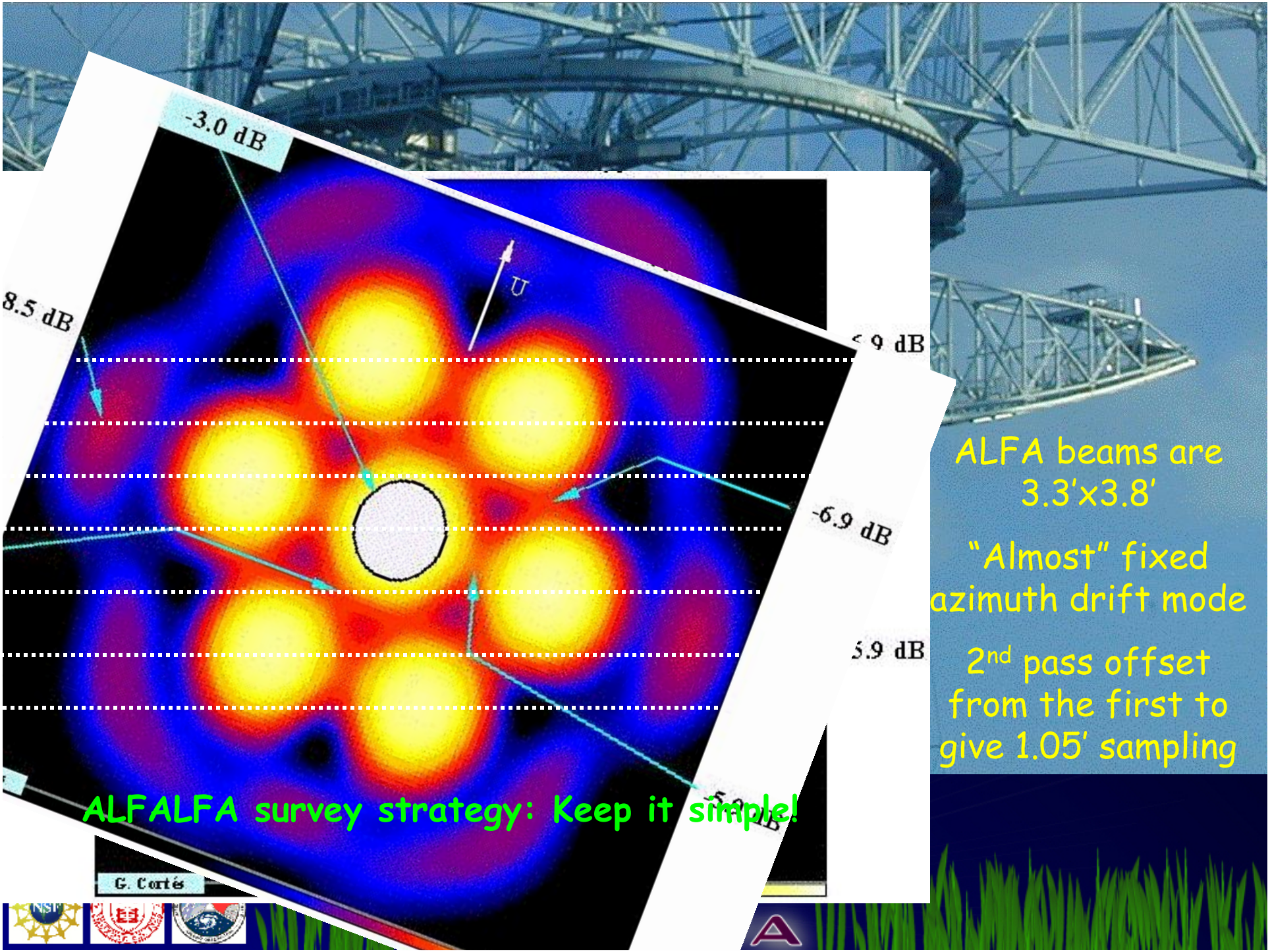
Technical considerations

- Gain, T_{sys}, footprint, sidelobes, RFI all change with Az, ZA, so adopt "fixed azimuth" mode
- Sensitivity falls off quickly beyond ZA > 15°
  i.e., Dec south of +3° or north of +33°
- Beam 0 has higher gain than outer pixels
- Beam orientation/spacing change with Az, ZA, ALFA RotAngl; desire drift tracks equally spaced in Declination
- Dome cannot track through zenith; minimum ZA for dome ~1.7°: "zone of avoidance"

ALFALFA



ALFALFA survey strategy: Keep it simple!

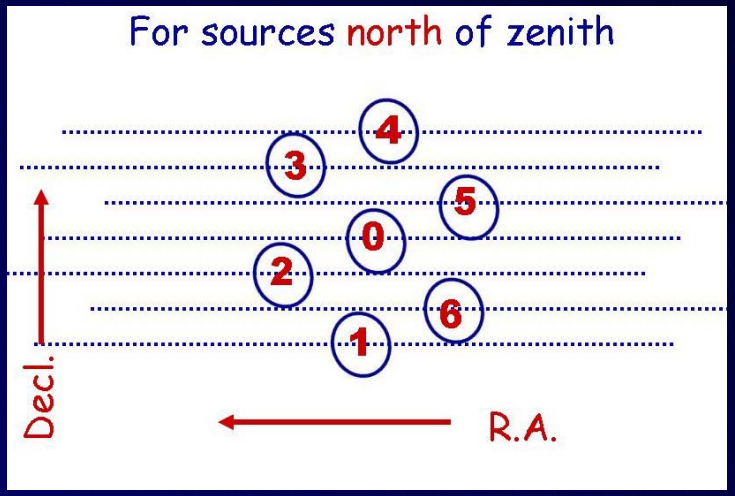
ALFA beams are 3.3′x3.8′

"Almost" fixed azimuth drift mode

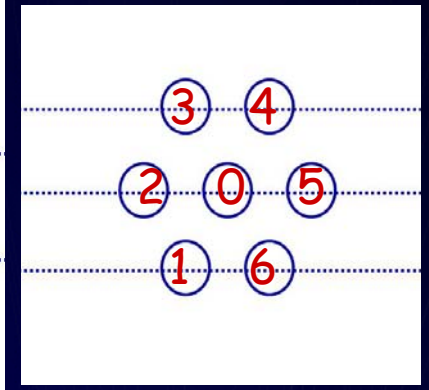
2nd pass offset from the first to give 1.05′ sampling

Array rotation

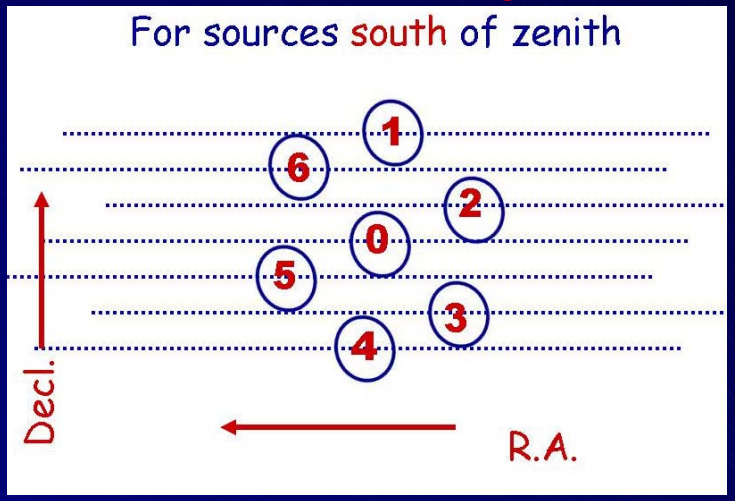
Dec > +18, RotAng=19



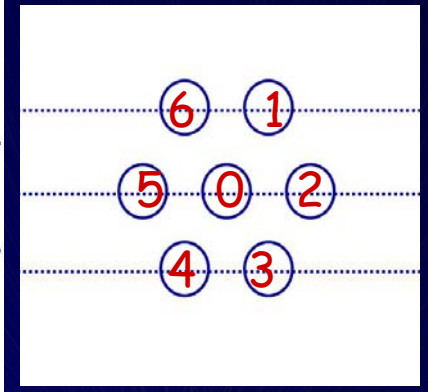
Dec > +18
No rotation



Dec < +18, RotAng=19



Dec < +18
No rotation



The individual feed horns move along an elliptical ring oriented in Az, ZA.

Note: The beams are actually elliptical, NOT circular.

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On meridian, 19° rotation

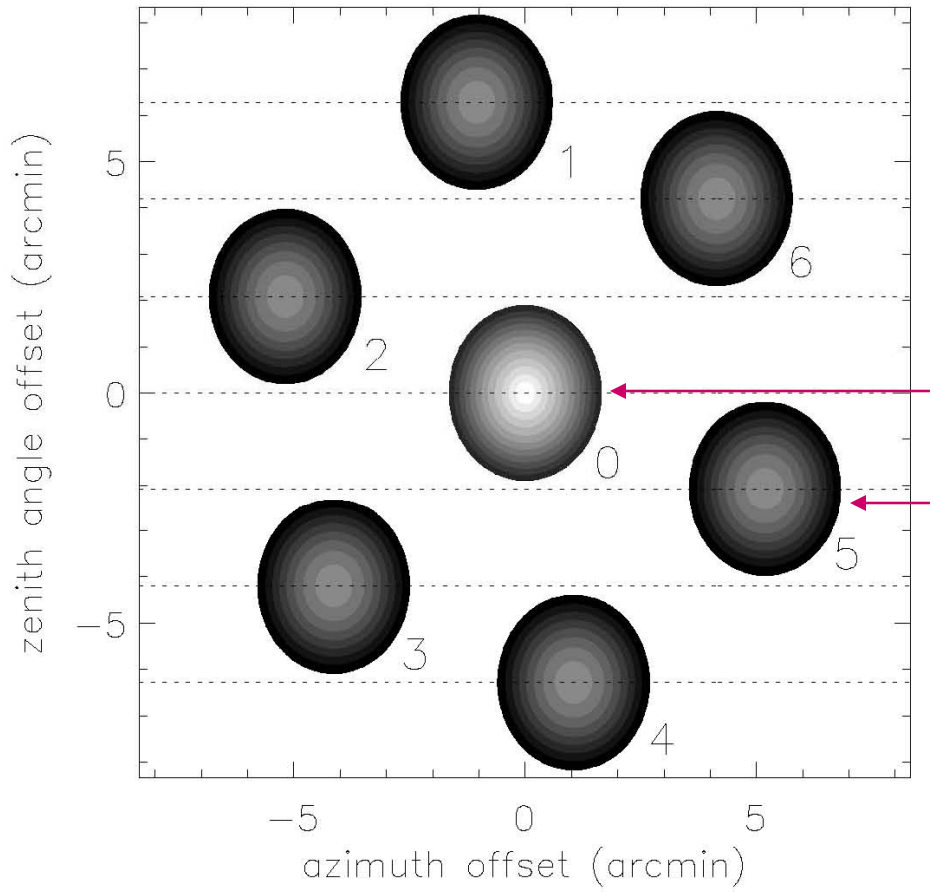

Fig. 2.— Sketch of the geometry of the ALFA footprint, with the array located along the local meridian and rotated by an angle of 19° about its axis. The outer boundary of each beam corresponds to the -3 dB level. The dashed horizontal lines represent the tracks at constant Declination of the seven ALFA beams, as data is acquired in drift mode.

Beam tracks are spaced equidistant in declination.

For a source south of zenith, the dome should be at azimuth 0° (or 360°).

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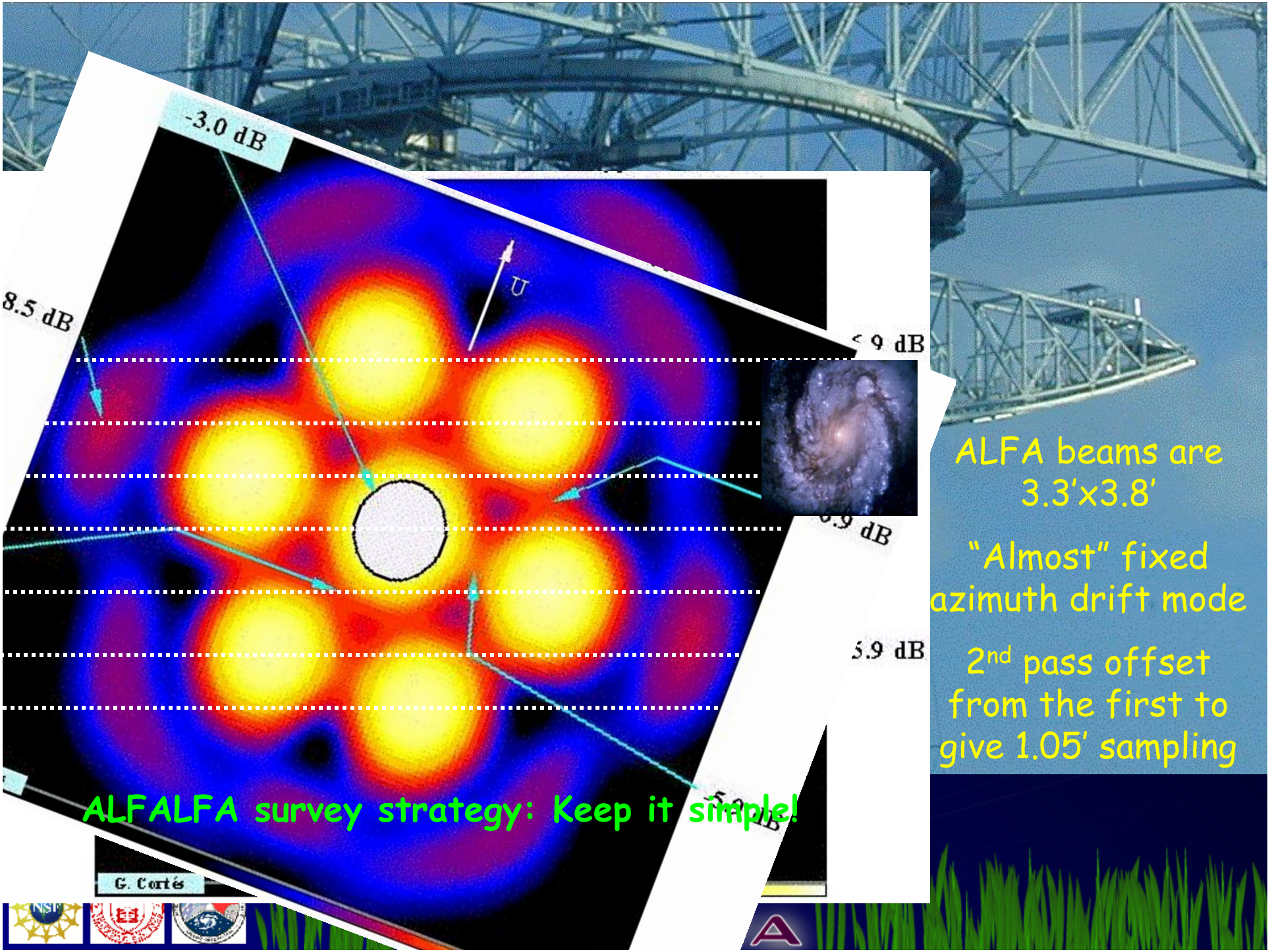

ALFA beams are 3.3′x3.8′

"Almost" fixed azimuth drift mode

2nd pass offset from the first to give 1.05′ sampling

ALFALFA survey strategy: Keep it simple!

ALFALFA drift mode

- "Almost" fixed azimuth drifts
  - Track in J2000 Declination
  - Declination of all survey drifts specified, except for +16° < DecJ < +20° (zenith "Zone of Avoidance")
- Specify observing "block" according to date/time at start, specified as yy.mm.dd

  08.01.14 : Tonight's (Mon am!) block

Block	Date	AST	LST	#	DecJ
08.01.13	S 13Jan	15h45-17h30	22h55-00h35	107p2	+260212
08.01.14	M 14Jan	00h30-07h00	07h35-14h05	107p2	+260212

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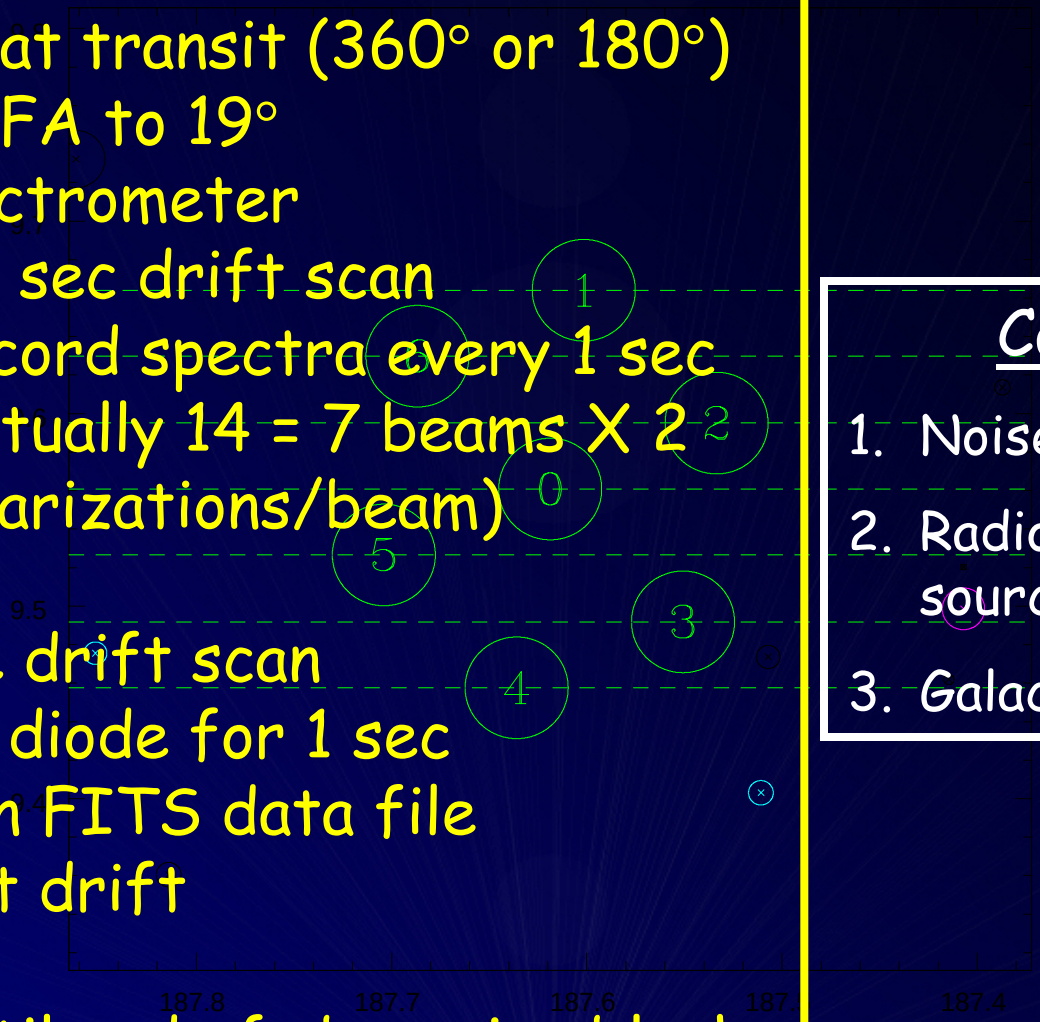
ALFALFA observing sequence

- Set dome at transit (360° or 180°)
- Rotate ALFA to 19°
- Setup spectrometer
- Start 600 sec drift scan
  - Record spectra every 1 sec (actually 14 = 7 beams X 2 polarizations/beam)

  .....
- Terminate drift scan
- Fire noise diode for 1 sec
- Close/open FITS data file
- Start next drift

  .....

  Repeat until end of observing block



Calibration:

1. Noise diode
2. Radio continuum sources of known flux
3. Galactic Hydrogen

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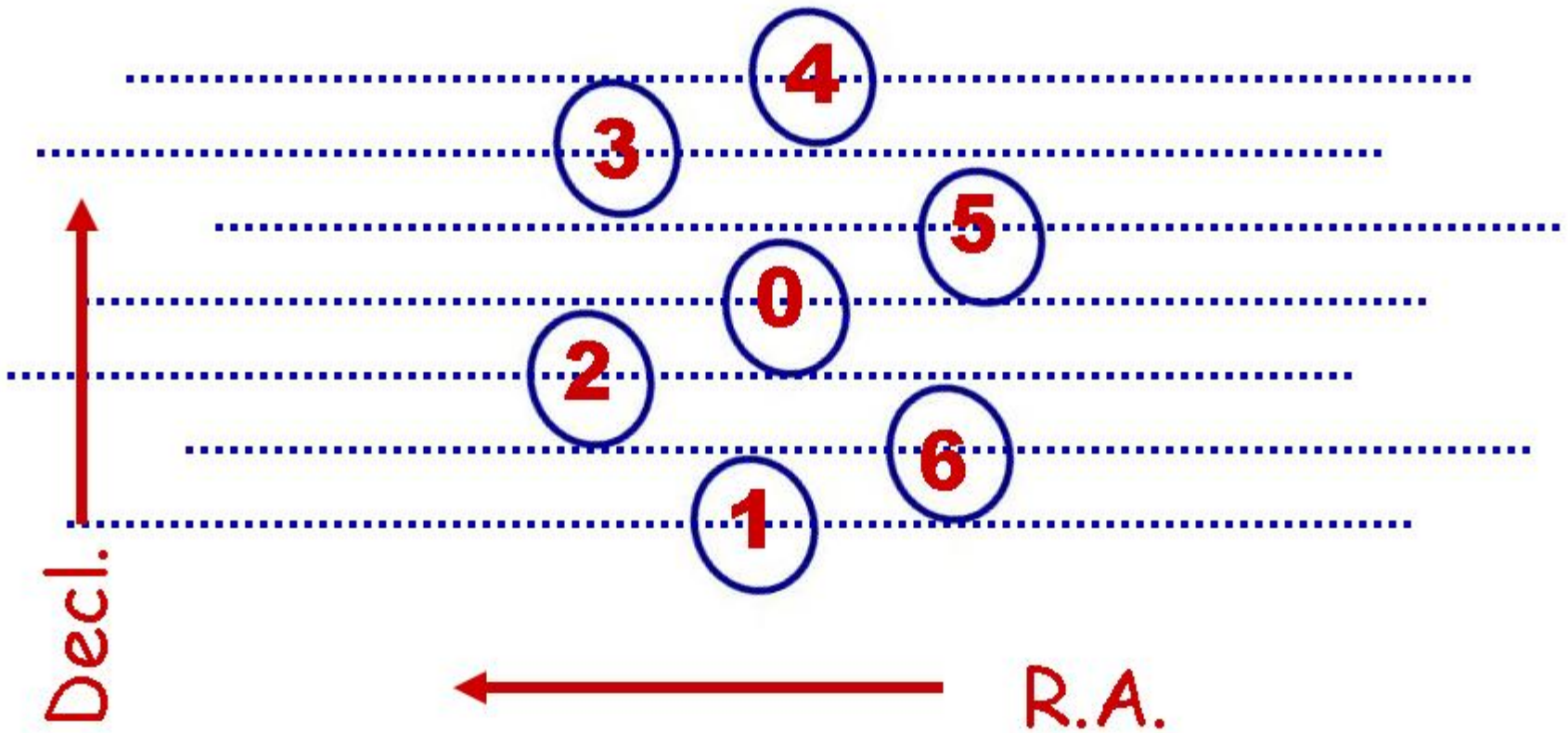
For sources north of zenith



Radio Frequency Interference

- Man-made signals are much stronger than cosmic ones!
- Some are always present; others come and go.
- Radars (e.g. FAA at San Juan airport) occur with some regular period (e.g. 12 sec)
- Some RFI is so strong that it "saturates" the front end.

We have to live with it (but we don't have to like it!).

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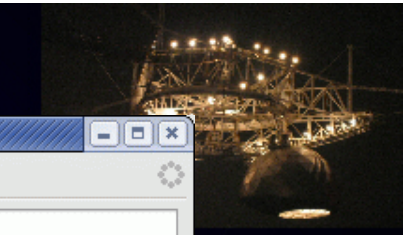
RFI List



Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://www.naic.edu/%7Ephil/rfi/rfilist.html#lband%20birdies

Go

User Record Viewer

1241.75 1244.6 1256.5 1261.25	1.67	jan97	active Radar	**Aerostat** radar ballon in lajas. dual freq or quad freq modes. 160 usec per pulse, chirped. Rotation rate 11.59 secs. Blanks toward AO. (see radar info)
1270/1290	.2	feb02	active Radar	**Remy Radar** at the end of the runway .(fps20-93a). 12 sec rotation rate, single ipp of 2781. Runs in 1270 or 1290 mode (not simultaneously). (see radar info)
1287.5/1299.84 1300,1399.83 1400 1411.52 1412.5	<.025	jan01 apr02		**Distomat** birdies. Occur every 2 minutes for a few seconds. Az dependent.Distomats have a 27 Mhz clock. Data was measured in jan01 (before shielding work) Data was remeasured in apr02 (after some shielding work). The window was changed
1330/1350	.2	jan97	active Radar	**FAA airport radar**.12 sec rotation, 5 ipps about 2.5 ms,5 usec pulse, 1350 then 1330 pulse sent each ipp. (radar info)
1366.2/1382.66 1324/1340 1387.3/1371.0		feb01	Radar	**Radars with 1.94 sec rotation** rates. (more info). These radar were probably associated with military ship practices. Fast rotating radars are needed when objects move far within 1 rotation (planes near aircraft carriers,etc..)
1381.05	1	sep91	active	**GPS L3** downlink. (more info)
1388.55	.024	98		**beeper** harmonic (3rd of 462.85)
1388.6	.024	93		**beeper** harmonic (3rd of 462.875) (borinquen beepers)
1388.858 1417.495	<190 (hz)	may02		**dome camera** birides. part of a comb of 14.3185 Mhz. (more info).
1390.8	.024	feb93		**beeper** harmonic (3rd of 463.6 (mr. beeper)
1407	.3	apr01	fixed	**tvChan20** arecibo. Drifted around with time. They were having trouble with their transmitter. (more info)
1422.5				**tvChan54** 2nd harmonic
1525-1545		aug03		**Inmarsat stdBC** ship,portable earch downlinks **Inmarsat stdM** ship downlinks

Done

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Two-pass strategy

We want to drift across each stop on the sky TWICE

- Double integration time
- Helps to discriminate cosmic sources from
    1. Noise
    2. RFI

We offset the 2nd drift by half of the beam spacing.

- Helps with position centroiding
- Evens out the gain scalloping

We conduct the 2nd pass 3-9 months after the first.

- Cosmic sources will have shifted in frequency due to the Earth's motion around the Sun, but terrestrial ones won't have.
- Some interference comes and goes.

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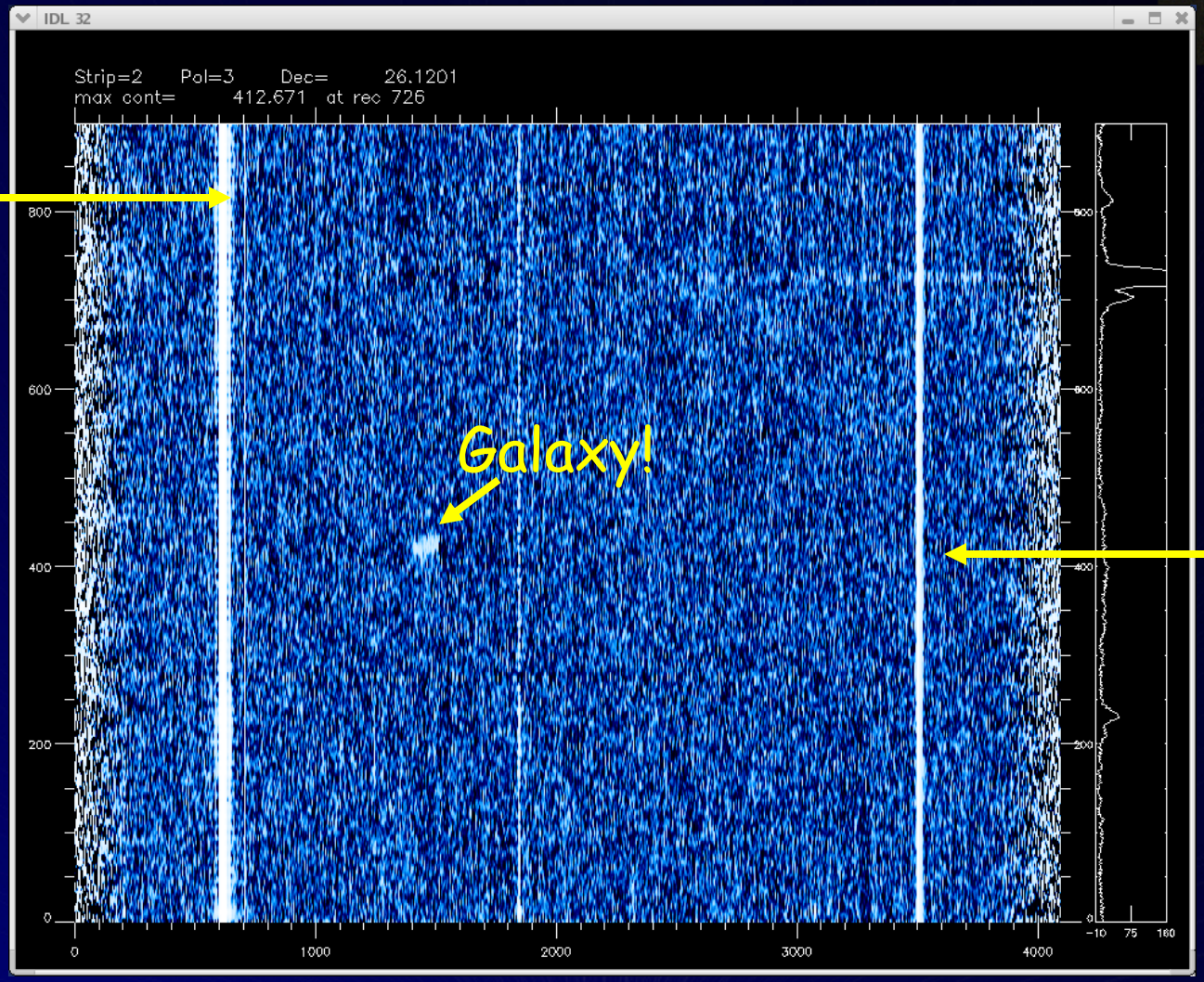
RFI is ugly



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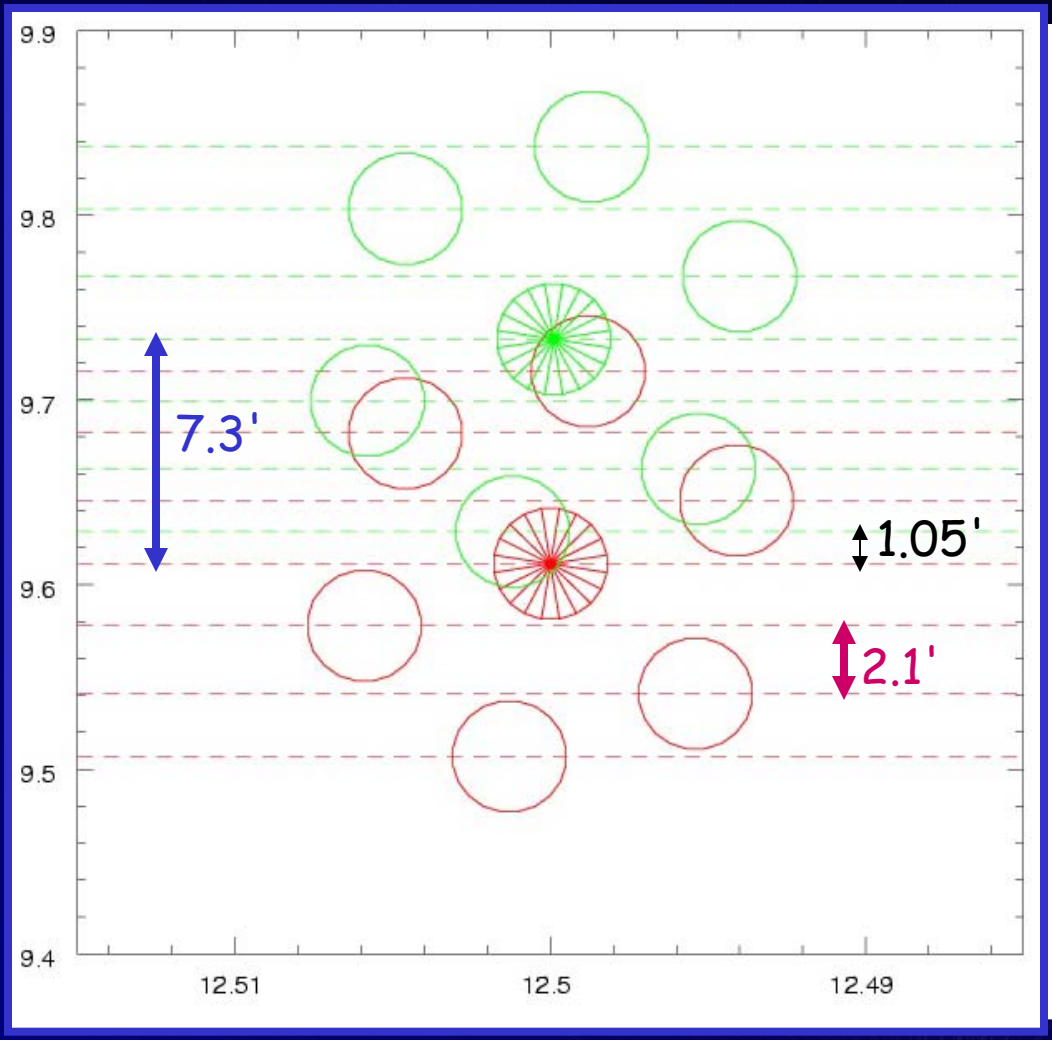
2-pass beam layout



Final coverage for 2 pass strategy

- For the 2nd pass, Beam 0, which has higher gain than the others, is offset by 7.3 arcmin from its 1st pass position.
- Some smoothing of gain scalloping.
- 2-pass sampling thus at 1.05 arcmin
- 2nd pass occurs 3-9 months after the 1st pass (vs. RFI)

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ALFALFA schedule notation

- "Master list" of drift declinations preassigned, starting at 0° and moving northward to +36° => DriftN, N = 1, 148
- Two passes: p1 and p2

107p1	+255454
107p2	+260212
108p2	+261648

14.6 arcmin

7.3 arcmin

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Tile coverage

Follow "tile" layout: each covers 4° in Declination

- Az = 360° for DecJ = +2°, +6°, +10°, +14°
- Az = 180° for DecJ = +22°, +26°, +30°, +34°
- Az ~ 90° for DecJ ~ +18° (close to zenith)

Proposal: Cover 2 tile tracks/per year, spring and fall

Spring and fall tiles not necessarily the same

Priority to PhD student thesis projects.

ALFALFA Scheduling Strategy

- ALFALFA aims to survey 7000 square degrees of high galactic latitude sky.
- "Fixed azimuth drift" mode: the telescope moves only slightly, to maintain constant Dec (J2000); Drifts offset by 14.6 arcmin.
- A "tile" of data will contain all beam positions within a box of 20 min in RA by 4 degrees in Dec.
- Within a single observing block, the data taking sequence consists of a series of 600 second (10 min) drifts at constant Dec J.
- Over a season, we try to "complete" sets of drifts within a tile: 16 drifts/tile/pass.
- The second pass occurs 3-9 months after the 1st pass (to aid RFI identification and signal confirmation).

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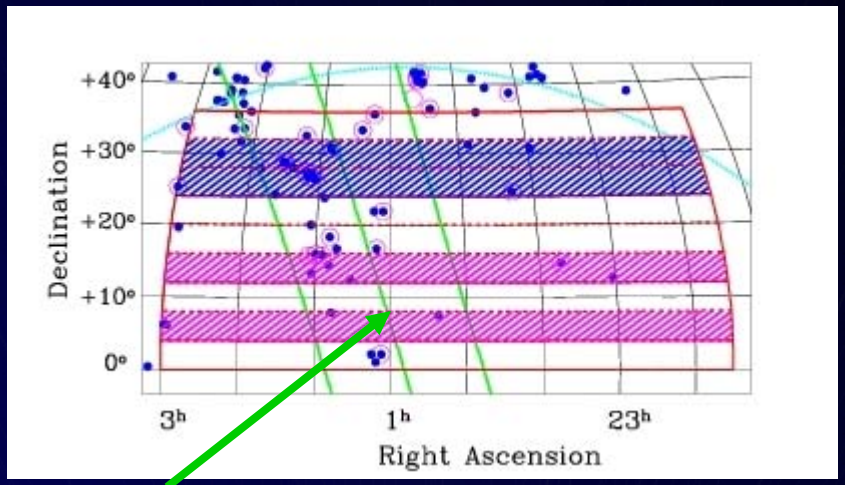
ALFALFA Survey 2005-7

High galactic latitude sky visible from AO

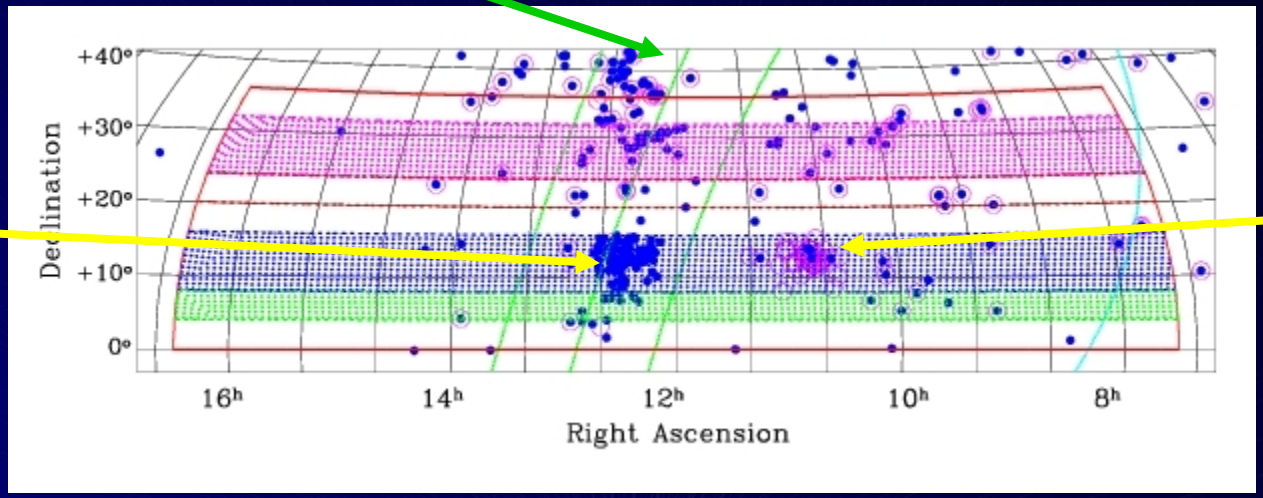


- Commensal with TOGS HI
- Does not compete with galactic plane surveys

Supergalactic plane

Virgo cluster

Leo Group



ALFALFA

Maximizing Observing Efficiency

- Telescope time is precious and competition is stiff.
- Our science goals demand high quality data.
- The legacy nature of ALFALFA raises the standards for data product generation and delivery.
- Arecibo and ALFA are complex instruments to use.
- RFI is nasty and inevitable.
- ALFALFA uses a lot of telescope time and generates a lot of data!
- The A2010 proposal was approved pending periodic reviews of our ability to perform the survey.
    - We got an A+ this year.

ALFALFA websites

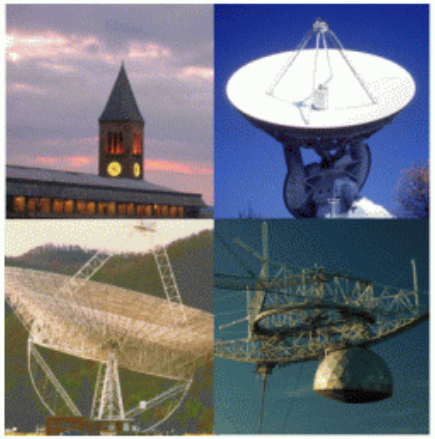
- Cornell website (public)
  - http://egg.astro.cornell.edu/alfalfa
- Cornell website (team only; password required)
  - http://caborojo.astro.cornell.edu/alfalfalog
- Arecibo A2010 website (not obvious)
  - http://www.naic.edu/~a2010/galaxy_a2010.html
- Milano Followup Team wiki (password required)
  - http://cosmos.iasf-milano.inaf.it/alfalfa_wiki/
- Undergraduate Workshop Observing Page
  - http://www.naic.edu/~alfalfa

ALFALFA sprouts!

Cornell University
Digital HI Archive

Home | Query | SQL | Schema | Cone | Plot | Download | Help | NVO | CU Astro | EGG | CTC

The Cornell Digital HI Archive



The Cornell Digital HI Archive will host the spectra, observed and derived parameters from large collections of HI 21 cm line galaxy surveys obtained using a number of radio telescopes, especially the 305 meter antenna, the world's largest radio-radar telescope which is located at the Arecibo Observatory, in northern Puerto Rico. The Arecibo Observatory is part of the National Astronomy and Ionosphere which is operated by Cornell University under a cooperative agreement with the National Science Foundation.

The first installment of this digital archive is the dataset presented by Springob, Haynes, Giovanelli and Kent, (2005, ApJS, 160,149). Covering 9000 galaxies in the local universe (spanning a heliocentric velocity -200 < V < 28,000 km/s) and obtained with a variety of large single dish radio telescopes, the data have been reanalyzed using a single set of parameter extraction algorithms. The database contains catalogs of HI parameters (systemic velocities, integrated HI line fluxes and full widths), plots of the HI spectra, and the digital spectra themselves. Subsets of the database can be extracted using Virtual Observatory standards and protocols.

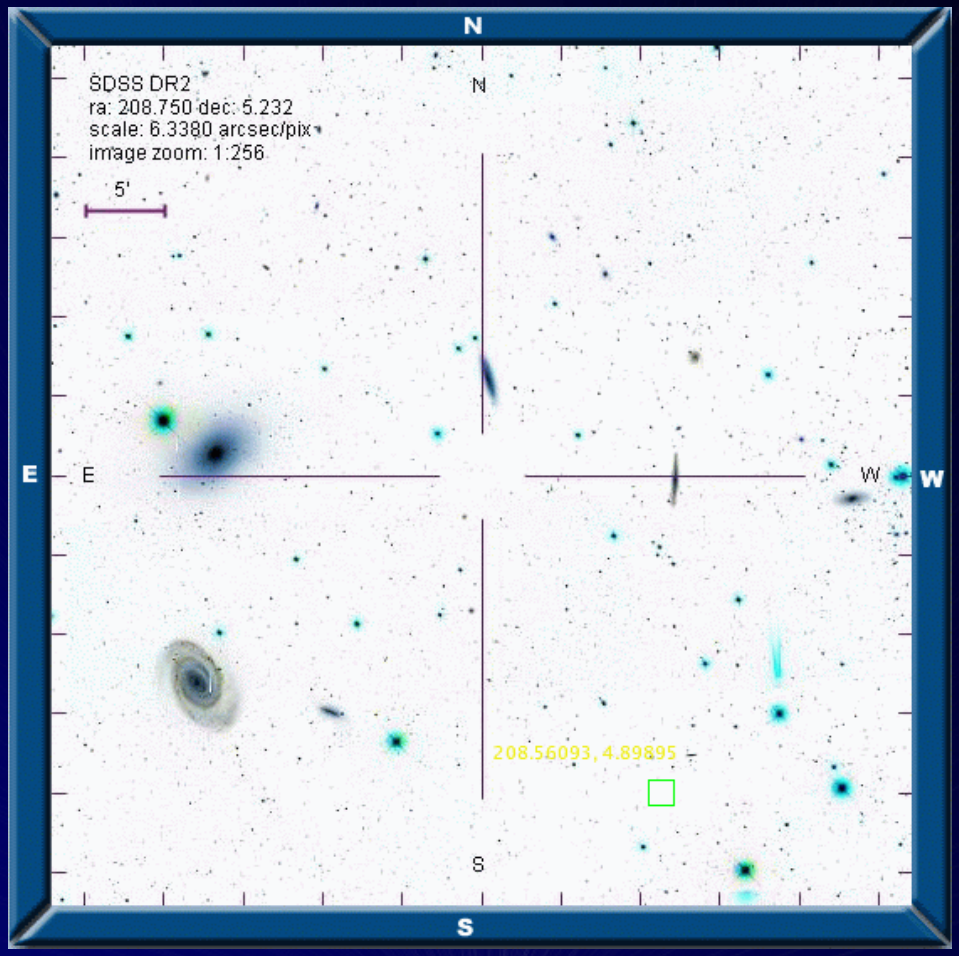
ALFALFA

Within the next month, we will add the first observations obtained with the Arecibo L-Band Feed

http://arecibo.tc.cornell.edu/hiarchive
http://egg.astro.cornell.edu/alfalfa

ALFALFA

So, enough talk; let's eat…!



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