Observing Practices and Issues

- Introduction to A2010 observing - Martha
- Issues in observing efficiency
- Observing team tasks

- Practical A2010 observing - Sabrina
- Remote observing

- ALFALFA drift nomenclature - Martha
- Spring 2005 summary
- Plans for Fall 2005
- Proposed plan for 2006

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"

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.

Practicalities of Scheduling

- Arecibo telescope time is in high demand.
- Arecibo serves a diverse set of scientists.
- We elect to observe only at night.
  - Reduced RFI levels
  - Minimal thermal effects
  - No solar interference
- Pass 2 needs to take place 3-9 months after Pass 1
- The telescope schedule changes on short timescales
  - Targets of opportunity
  - Hardware failures (theirs or ours)

A2010 blocks often cover only part of the RA range

Example Schedule: I

TRANSMITTERS

2380 | 430 | HF

Opt | 47

System Checks

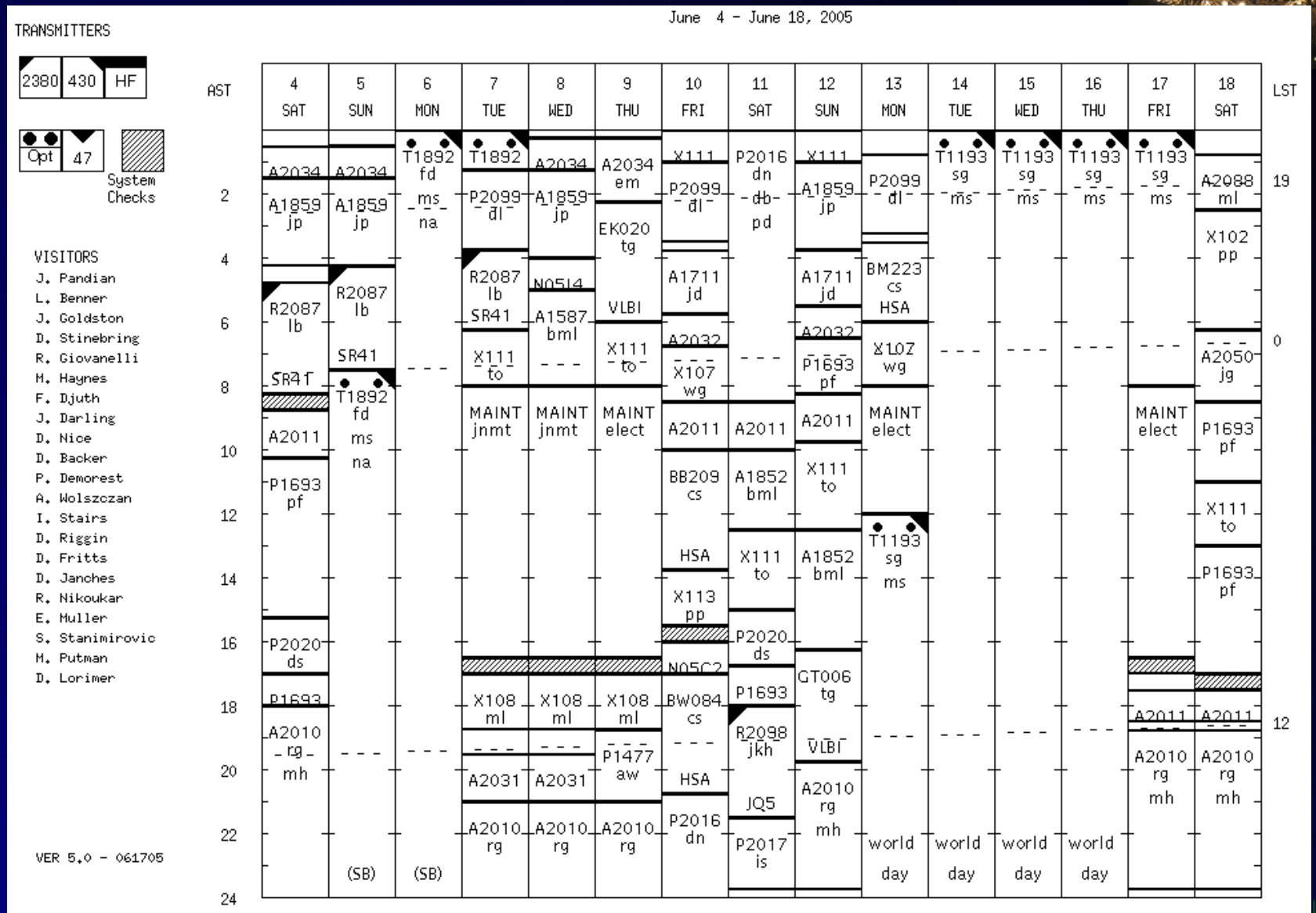
VISITORS
E. Muller
M. Haynes
R. Giovanelli
S. Schneider
W. van Driel
J. Pandian
A. Wolszczan
J. Hessels
D. Stinebring
D. Nice
D. Backer
P. Demorest
S. Stanimirovic
A. Brown
E. Berger
S. Kulkarni
F. Jenet
D. Champion
J. Goldston
C. Heiles
F. Camilo
I. Stairs
M. Putman
J. Cordes
M. K. Shepard
L. Olmi
R. Cesaroni

VER 3.0 - 050605

May 7 - May 21, 2005

AST	7 SAT	8 SUN	9 MON	10 TUE	11 WED	12 THU	13 FRI	14 SAT	15 SUN	16 MON	17 TUE	18 WED	19 THU	20 FRI	21 SAT	LST
2	A2010 rg	A2010 rg	A2010 rg	A2010 rg	A2010 rg	X102 pp	A1589 bml	A2010 rg	P2016 dn db pd	A1785 tg	P1920 jh	P2017	A2010	A2010	A2010	
	A2034	A1967 lo rc	A1967 lo rc					A1972 ss		A2034 emm		A2034	A2034	A2034	A2034	
4	R2030 jc/fc			A1859 jp	A1859 jp	A1859 jp	A1859 jp	P1871 fj			P1979 ss	P1979 ss	P1979 ss	P1979 ss	P1979 ss	19
											A2034	A2034	A2034	X102 pp	X102 pp	
6				P1693 pf	A1587 bml	A2005 eb sk	A2005 eb sk	P1681		P1693 pf	X111 to	P1693 pf	A1852 bml			
	A1972 ss wyd	X111 to	MAINT jnmt	MAINT jnmt	MAINT elect			P1918		A2032	A2032	A2032	A2032	A2032	A2032	
8								A2005 eb		MAINT elect	MAINT elect	MAINT jnmt	MAINT jnmt	X113 pp	P1693 pf	0
10		A1852 bml				MAINT elect	X107		X111 to					A2011	A2011	
	X111 to						X113 pp	A1852 bml						X108 ml	X111 to	
12									P1693 pf					MAINT elect		
14	P1693 pf	X111 to													A1852 bml	
							A2005 eb	A2005 eb		A2006 ab	A2006 ab		P1927 ds			
16		P2020 ds	X108 ml	X108 ml	X108 ml	X108 ml			P2020 ds			X108 ml		X111 to		
18								X111	X111 to	P1927 ds	X102 pp					
	A2010 rg mh	A2010 rg mh	A2010 rg mh	A2010 rg mh	A2010 rg	A2010 rg	A2010 rg mh	A2005				A2010 rg mh	A2010 rg mh	A2010 rg mh	A2010 rg mh	
20					R2096 mks	R2096 mks		P1477 aw	A2031 eh Templ		A2031 eh Templ					12
22								P2016	A1785	P1920 jh	P2017					
24																

Example Schedule: II.



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Task Assignments

- Designated observer (Sabrina: May 18-Jun 4)
  - Executes and monitors observing
  - Writes log file of scans with times, notes, etc.
  - Creates list of good fits files
  - Updates Arecibo website with log, cimalog, fitslist
  - Converts FITS to raw IDL
  - Verifies data quality (first check)
- Designated Arecibo file monitor (Barbara/Brian/Martha)
  - Checks that files were converted properly
  - Checks that IDL files are transferred to CU
- Designated CU archivist (Martha/Brian)
  - Relocates files to proper disks at CU
  - Insures and logs file status and location
  - Updates CU website with file info
- Designated scheduler (Martha/Brian)
  - Produces and maintains detailed schedule
  - Checks/updates a2010.cat at Arecibo
  - Updates Arecibo/CU websites with scheduling info

Sabrina will now talk about "Observing Practicalities”

ALFALFA

Tiling the Sky

1. ALFALFA drift nomenclature
2. Current observing summary
3. Plans for fall 2005 observing
4. 2006 request

ALFALFA

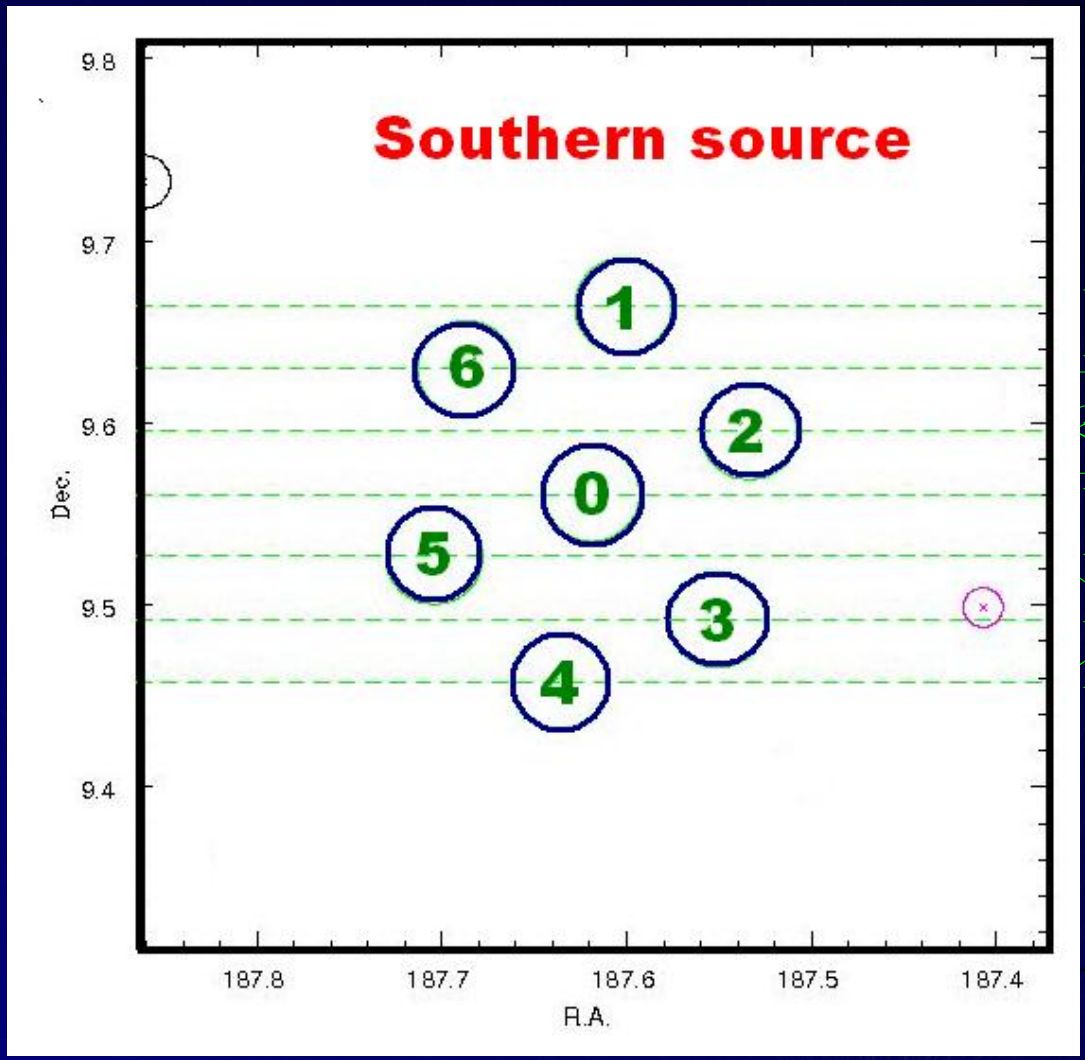
ALFALFA drift mode

- "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 expressed as yy.mm.dd
  - 05.06.19 Sunday night's observing

Block	Date	LST0h	AST	LST	#	DecJ
05.06.19	S 19Jun	17h23	18h45-23h45	12h11-17h11	41p1	+095118

Beam layout on sky

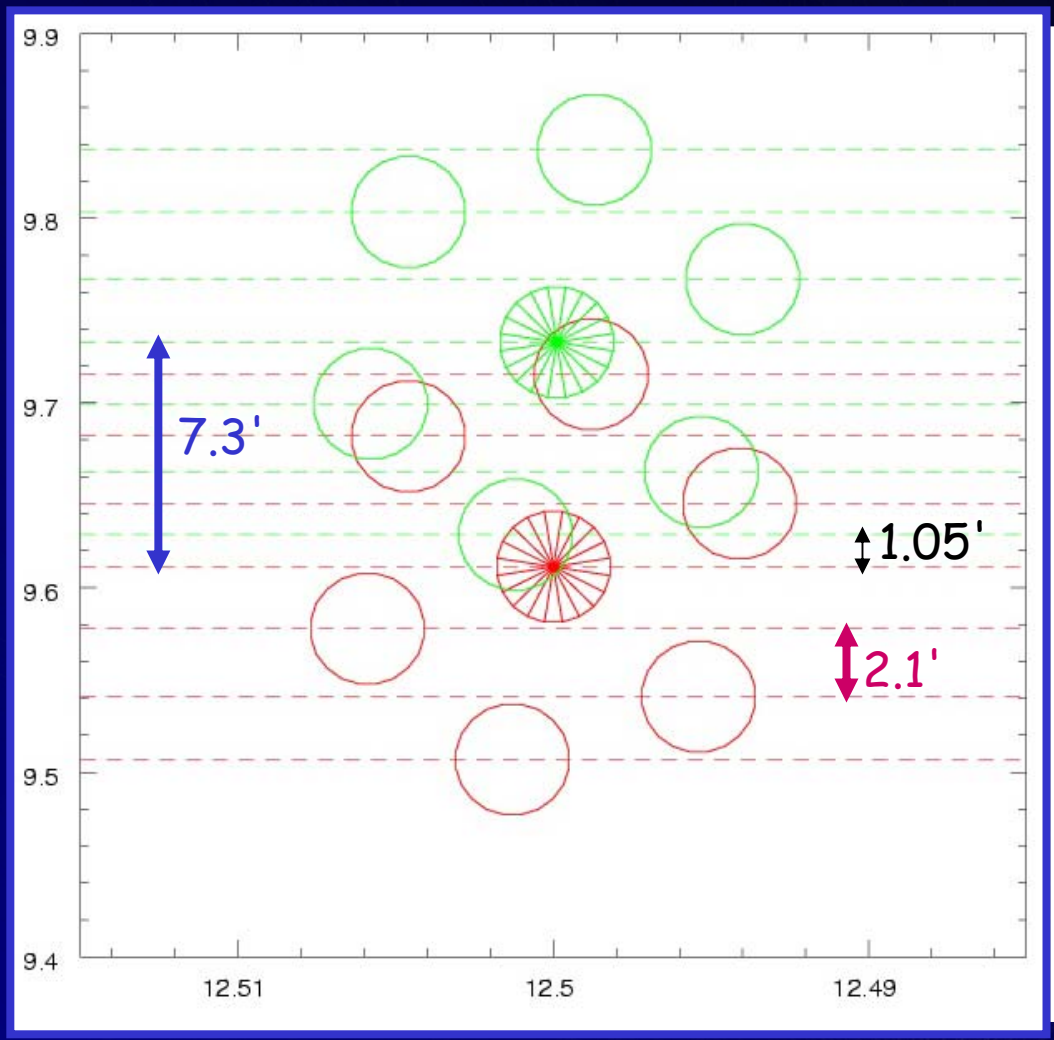


Beam orientation for source on meridian south of AO zenith, for ALFA rotation angle of +19°.

For this ALFA configuration, the tracks are spaced every 2.1 arcmin in Declination.

ALFALFA

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

41p1	+095118
42p1	+100554
42p2	+101312

14.6 arcmin

7.3 arcmin

Drift declination assignments

40	40p1	9.611670	+093642	40p2	9.733337	+094400
41	41p1	9.855003	+095118	41p2	9.976671	+095836
42	42p1	10.098337	+100554	42p2	10.220005	+101312
43	43p1	10.341671	+102030	43p2	10.463339	+102748
44	44p1	10.585005	+103506	44p2	10.706673	+104224
45	45p1	10.828339	+104942	45p2	10.950006	+105700
46	46p1	11.071672	+110418	46p2	11.193340	+111136
47	47p1	11.315006	+111854	47p2	11.436674	+112612
48	48p1	11.558340	+113330	48p2	11.680008	+114048
49	49p1	11.801674	+114806	49p2	11.923342	+115524
50	50p1	12.045008	+120242	50p2	12.166676	+121000
51	51p1	12.288342	+121718	51p2	12.410009	+122436

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).

Tile coverage

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

- Az = 0° for DecJ = +2°, +6°, +10°, +14°
- Az = 180° for DecJ = +22°, +26°, +30°, +34°
- Az ~ 90° for DecJ ~ +18° (close to zenith)

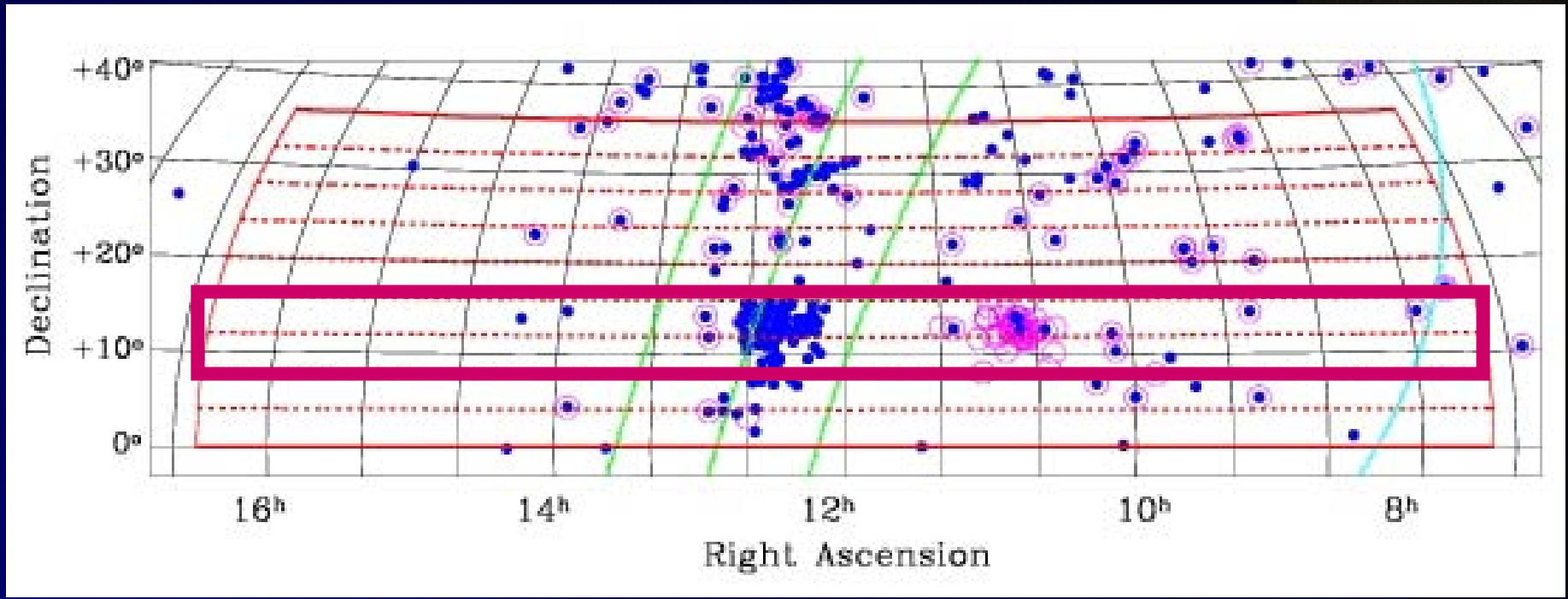
Proposal: Cover 2 tile tracks/per year, spring and fall

Spring and fall tiles not necessarily the same

Spring 2005: +10° and +14°

Fall 2005: +26° and +30°

ALFALFA: Spring Sky



2005: Tiles at +10° and +14°

- Leo to Virgo region
- Leo Group
- Virgo cluster core

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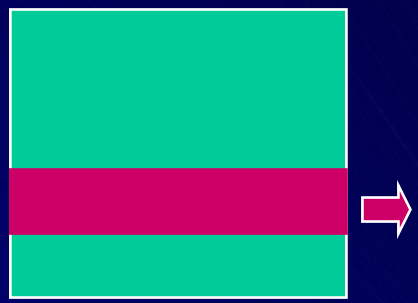
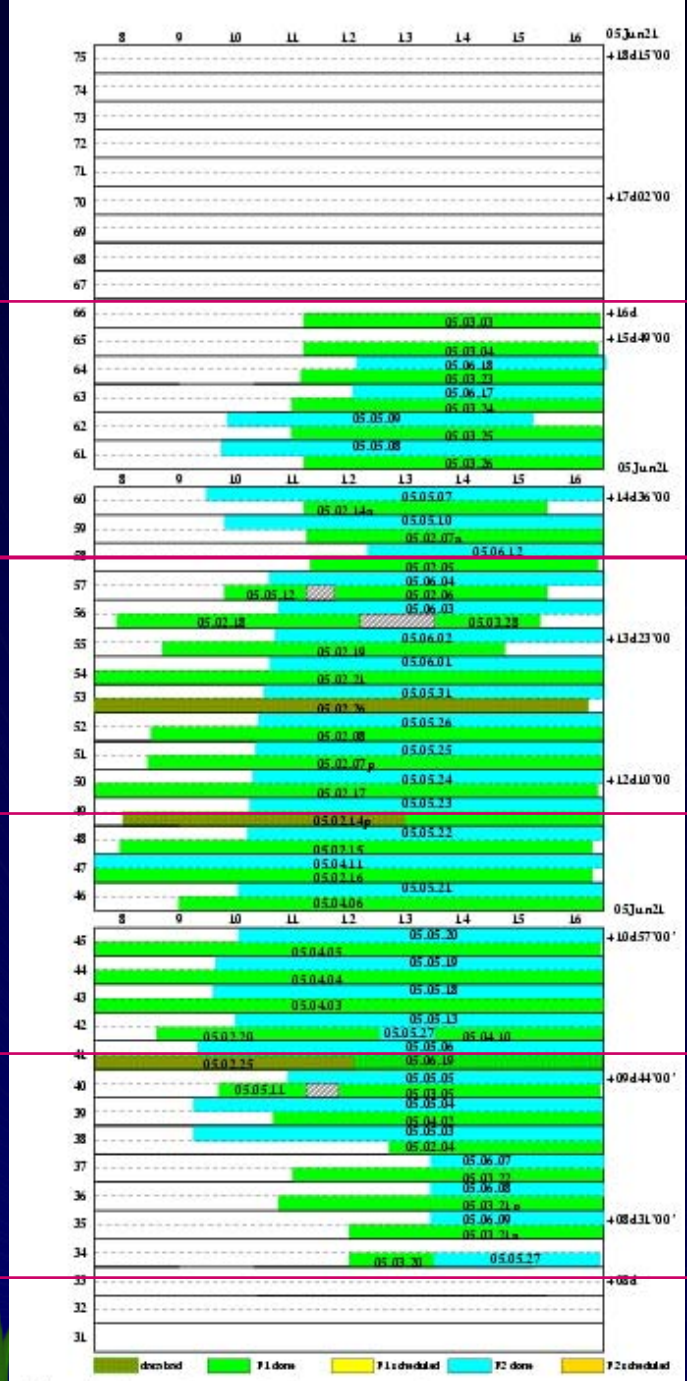
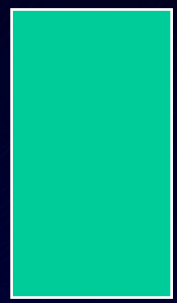
ALFALFA Current status



7.5h 16.5h





22h 03.5h

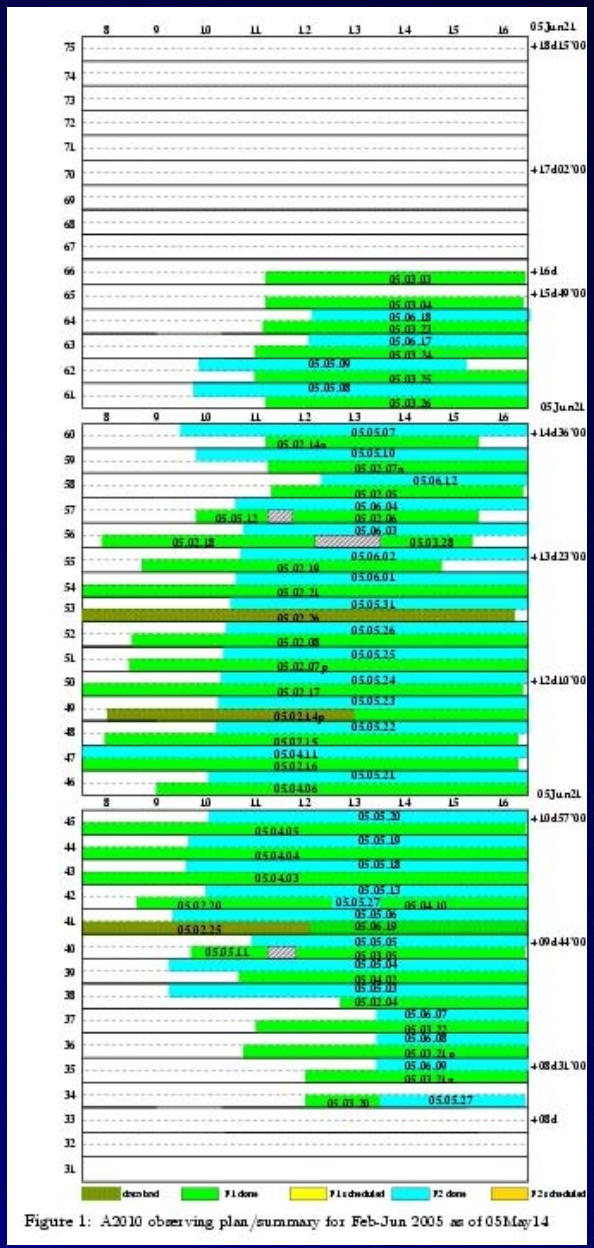


Figure 1: A2010 observing plan/summary for Feb-Jun 2005 as of 05May14

Status

- Started 1st pass Feb 4
- Started 2nd pass Apr 11
- Allocation ended Jun 12
  (Have picked up 4 more slots on short notice due to cancellation of other programs)
- Coverage incomplete in RA
- Almost complete in Decl.
- Except for hardware failures, 97% of assigned time is used for science

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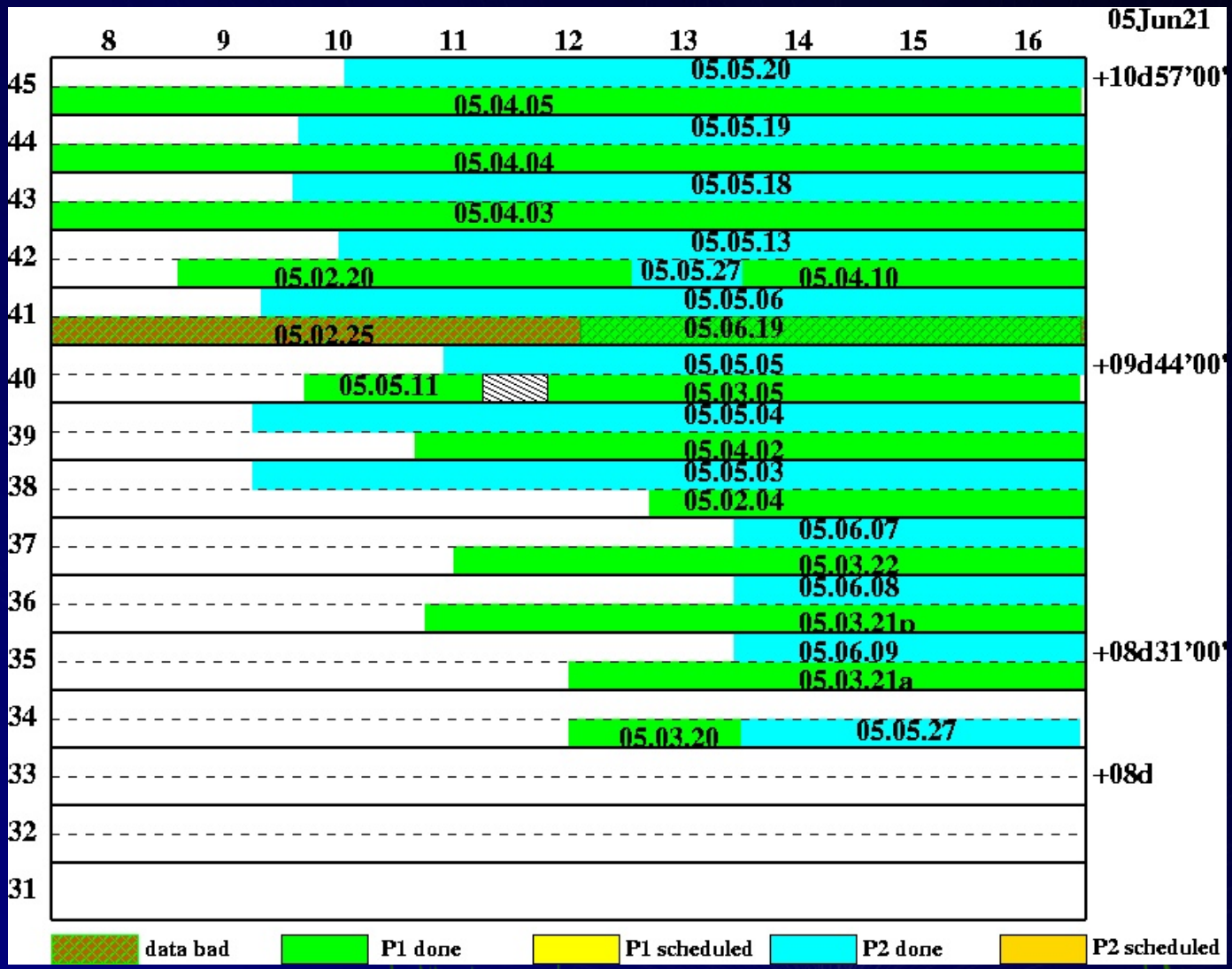
Current Schedule Summary: I.



- Largely complete north of Dec. +9°
- Complete to +8° in Spring '06

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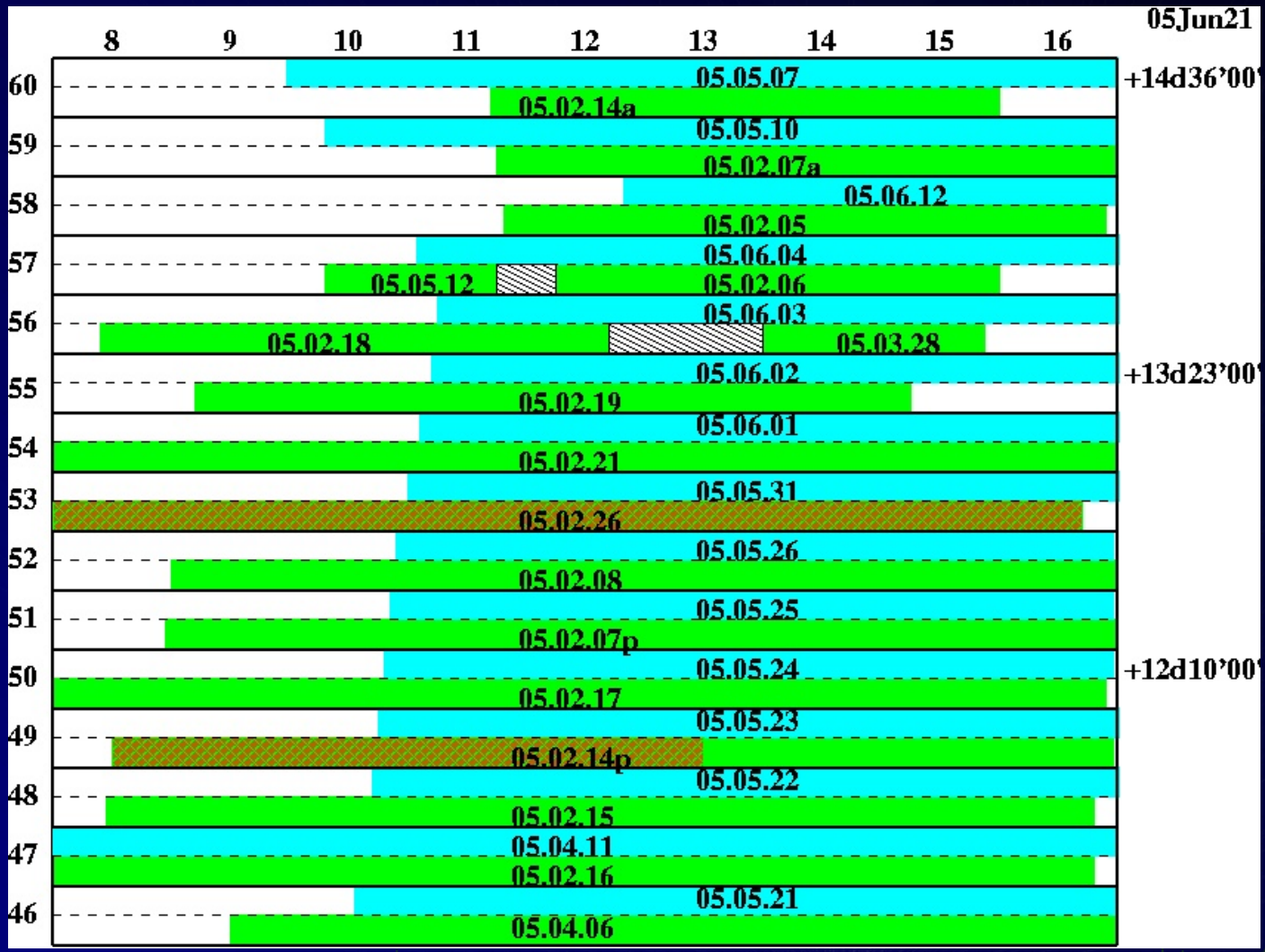
Current Schedule Summary: II.



Largely complete across Leo to Virgo region by Jun 12

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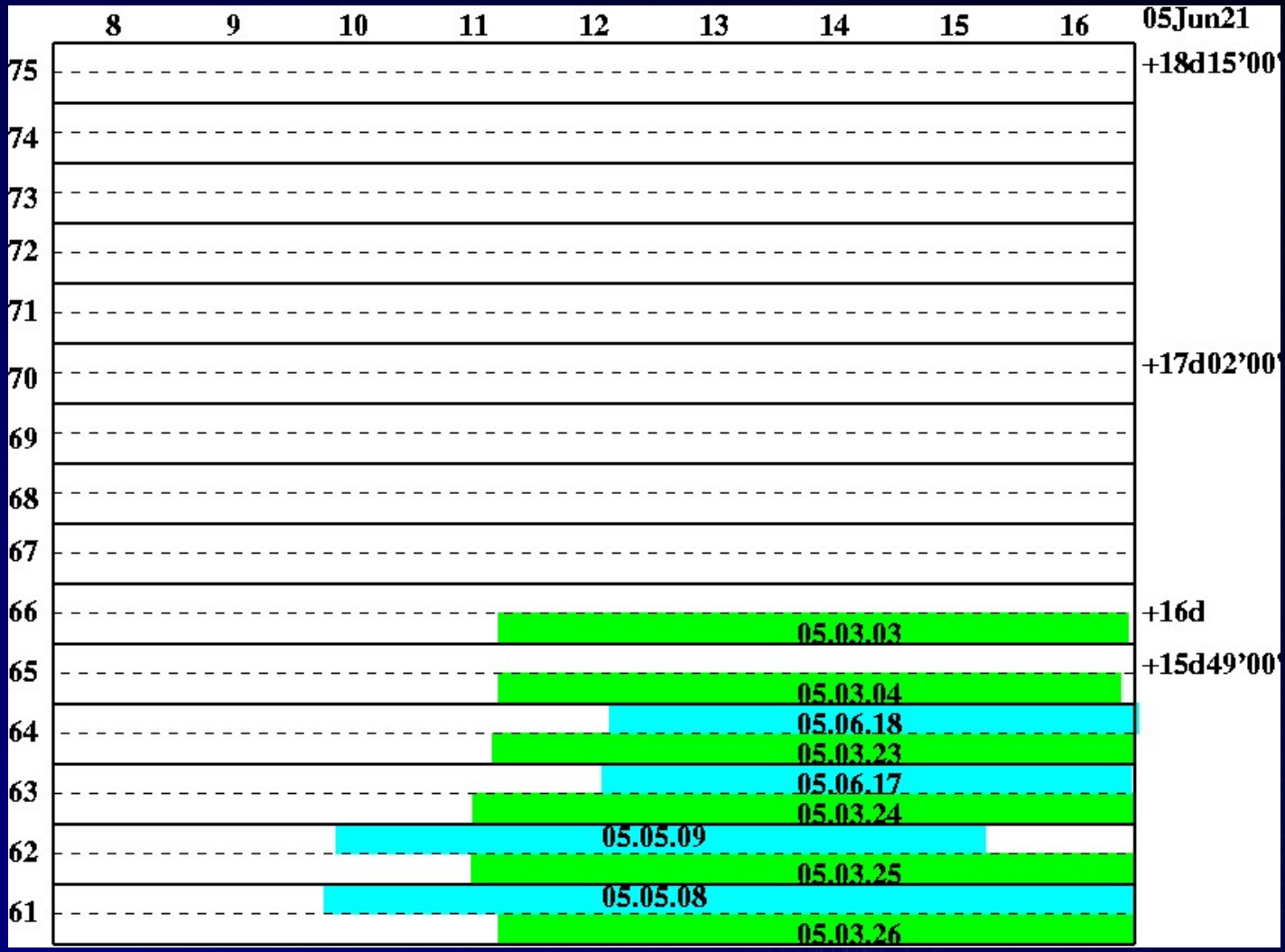
Current Schedule Summary: III.



- Not enough time this spring
- Complete to +16° in Spring '06

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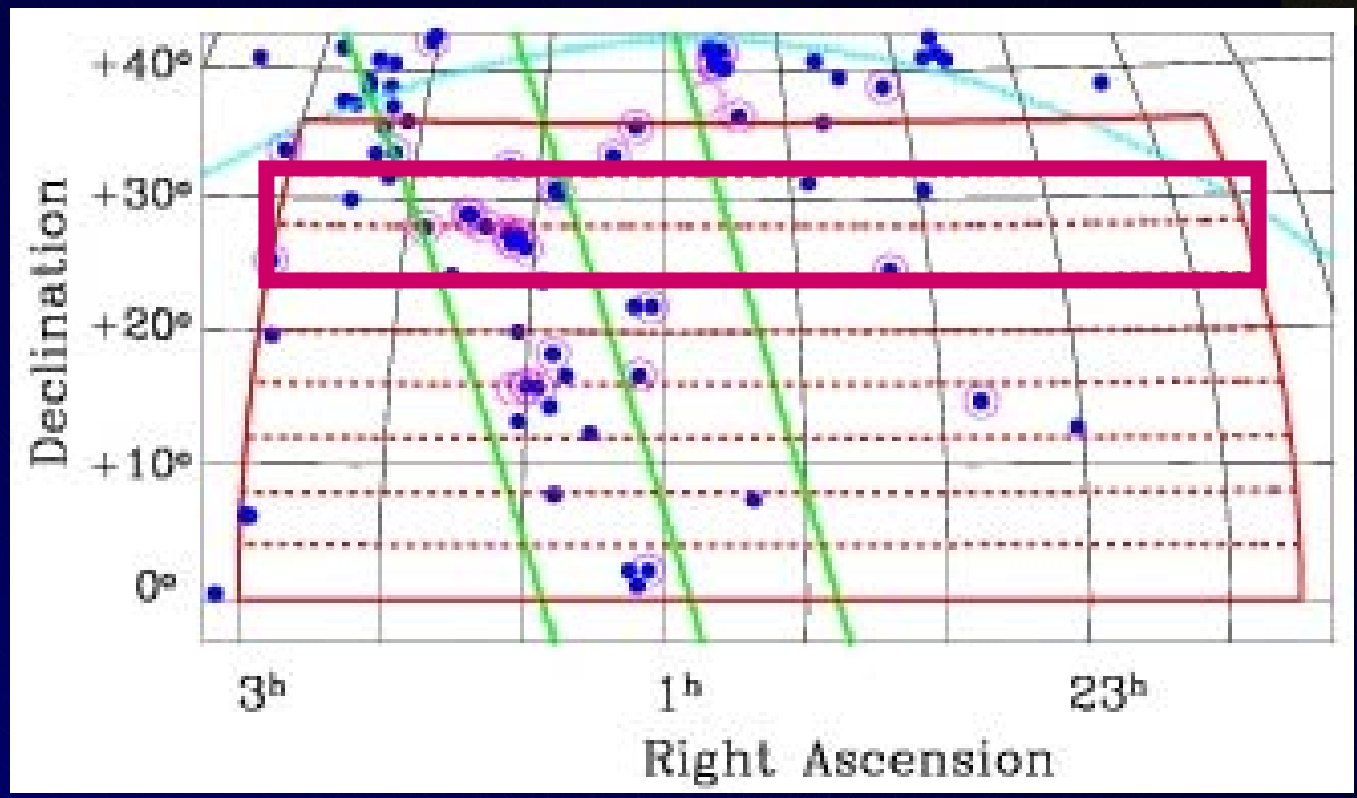
ALFALFA: Fall Sky



2005: Tiles at +26° and +30°

- Region around M33
- NGC 672 group
- NGC 784 "group of dwarfs"

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Possible 2006 Request

Similar to 2005 request:

- 2 "spring" tiles (2 x 33 sessions of 9+ hours)
- 2 "fall" tiles (2 x 33 sessions of 5+ hours)

Possible coverage:

- **Spring**
  - +06° : includes SMUDGES strip
  - +20° : A1367, NGC 2903
  - (+30°: Coma)
- **Fall**
  - +14° : NGC 628 group
  - +34° : Complete M31-M33 region; high ZA
  - (+06°: includes SMUDGES strip)

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Milano Workshop May 30

- Agenda very similar
- ~20 attendees including:
  - Milano-Brera: Angela Iovino, Chris Marinoni
  - Milano-Bicocca: Peppo Gavazzi, Olga Cucciati
  - Milano-CNR: Marco Scodeggio
  - Arcetri: Carlo Giovanardi (+ Leslie Hunt)
  - Roma: Roberto Scaramella, SabinaSabatini
  - Marseille: Ale Boselli
  - Barcelona: Jose-M Solanes
  - ESO: Emanuela Pompei
  - U. Washington: Fabio Governato