

21cm Hydrogen
1 meter
Umbrella Radio Telescope

Design Goal :
balance

Cost Complexity Portability Performance



<https://www.youtube.com/watch?v=ymclkNnCeCc>

White Satin Photo Umbrella



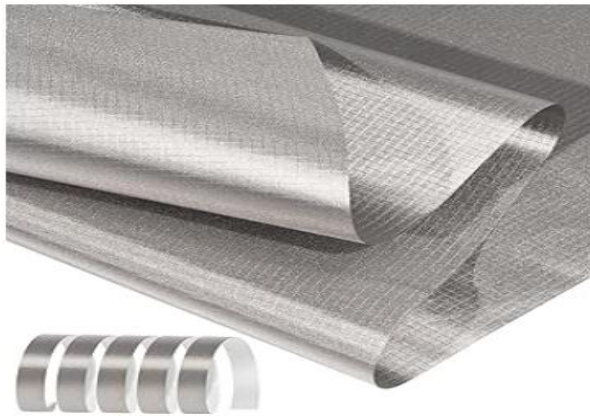
Westcott 2005 45in.
Optical White Satin
Umbrella

\$21⁹⁰

with fiberglass ribs



Nickel Copper Faraday Fabric



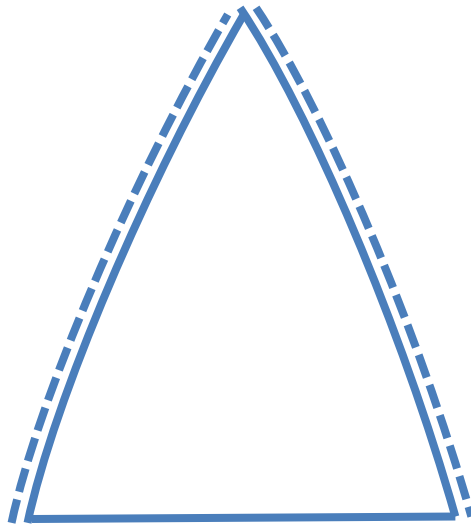
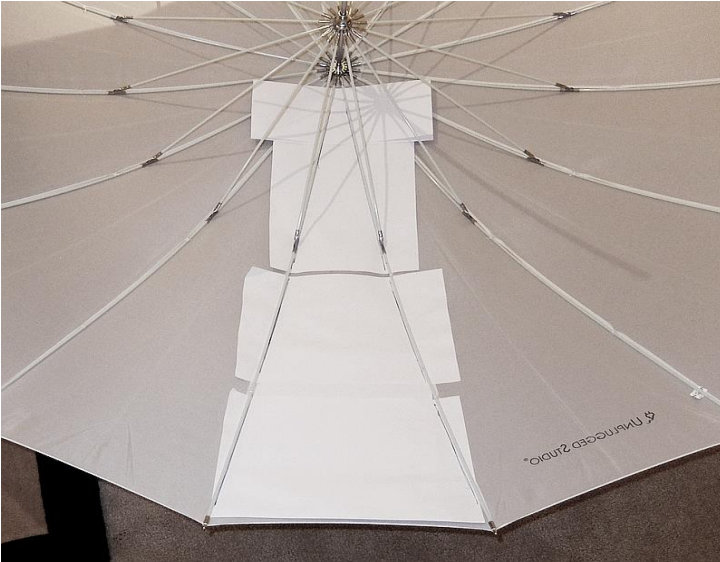
Brand: Dingbaayee

\$23⁹⁸

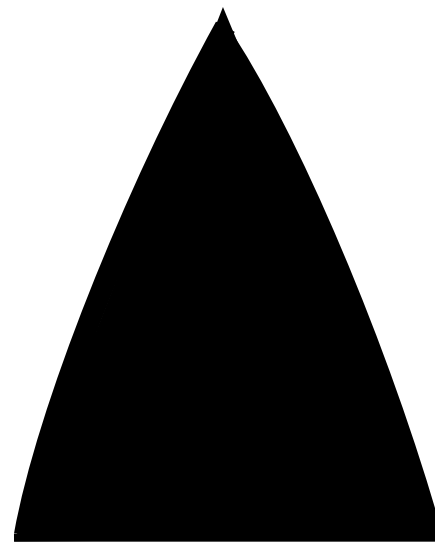
Faraday Fabric, Faraday
Cloth 43"x118" with
Faraday Tape Military
Grade Protection Nickel
Copper Faraday Cloth
for WiFi, GPS

Brand: Dingbaayee

**Trace Shape on Paper & make a
Cardboard Template**

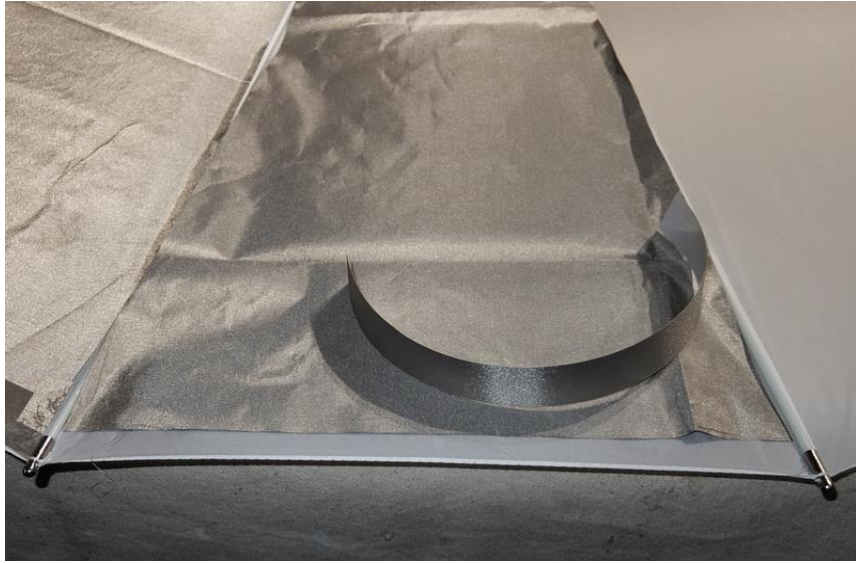


**Cut width 1/4" - 3/8" oversized to
Extend Under Ribs**



**Make a Cardboard or Foam Core Board
Template**

Align panel with ribs and attach with 1" tape at outer edge
Make small cutouts for rib <> umbrella tie strings



Spray umbrella then segment with contact cement
Protect previously installed panels



Use dry brush to install
Push edges of panel segment under ribs to overlap



21cm (1.42GHz) Loop Feed Components



Parrish's Magic Line Round Cake Pan, 6 x 2

Brand: Parrish Magic Line

★★★★★ 243 ratings

\$9⁹⁹

✓prime One-Day

FREE Returns

Get a \$100 Gift Card: Pay \$0.00 ~~\$9.99~~ upon approval for the Amazon Prime No annual fee.

Size: 6 x 2 Inch

6 x 1 Inch

--

6 x 2 Inch

\$9.99

✓prime

8 x 1 Inch

--



Boobrie SMA Coaxial Cable Connector SMA to F Coax Connector F Female to SMA Male Adapter for LAN / LMR Wireless Antenna Devices / RF Coaxial Cable / WiFi Radios External Antenna Pack of 2

Visit the Boobrie Store

★★★★★ 106 ratings

\$6¹⁹ (\$3.10 / Count)

✓prime One-Day

FREE Returns

With Amazon Business, you would have saved \$156.94 in the last year. [Create a free account](#) and save up to 5% today.

Compatible Devices	Scanner
Connector Type	Coaxial
Connector Gender	SMA Male, Male-to-Female, F type Female
Brand	Boobrie
Number of Ports	1

Click image to open expanded view

Click image to open expanded view





Eowpower 270Pcs 8 Sizes Nylon Metric Sealing Washers Assortment Set

\$8.98

In Stock

✓prime & FREE Returns ▾

☐ This is a gift [Learn more](#)

Style: Nylon

Qty: 1 ▾

[Delete](#)

[Save for later](#)

[Add to list](#)

PMMA tube

The round pipe is made of PMMA material, with strong impact resistance and easy processing; Good insulation; Durable and long service life



MECCANIXITY Acrylic Pipe Rigid Round Tube Clear 8mm ID 12mm OD 305mm(12") for Lamps and Lanterns, Water Cooling System

Brand: MECCANIXITY

★★★★★ ▾ 86 ratings

\$6⁹⁹

✓prime
FREE Returns ▾

Size: 8mm x 12mm

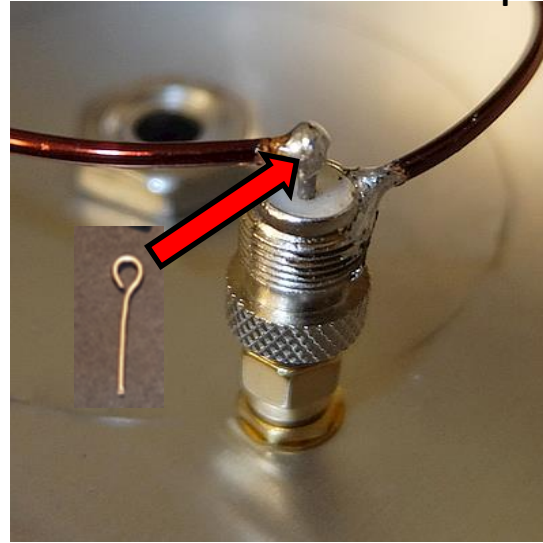
8mm x 12mm

9mm x 12mm

1.42 GHz Loop Feed Antenna Fabrication

adapted from OM6AA design
http://om6aa.eu/Loop_Feed_with_enhanced_performance.pdf

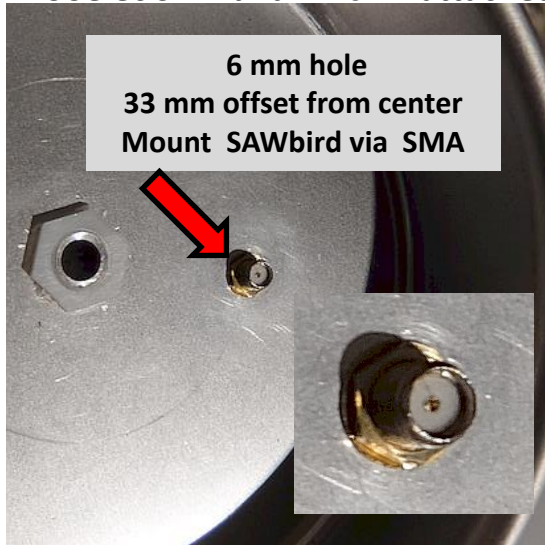
F-type <> SMA Adapter soldered to 21cm circumference wire loop



Completed Loop



nooelec SAWbird H1 SMA attached to 6" dia x 2" deep Cake Pan



Complete Loop Feed Assembly



Coaxial Cable



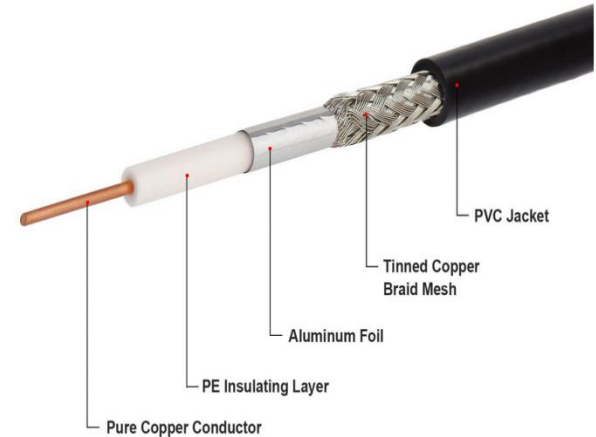
KMR240 SMA Male to SMA Male
Coaxial Cable 50 ohm Coax Ultra
Low Loss Antenna Extension for
3G/4G/5G/LTE Network Equipment
GPS, RF Radio (25FT)

[Visit the MOOKEERF Store](#)

4.5 ★★★★★ 99 ratings | [Search this page](#)

\$22⁹⁹ (\$0.92 / Foot)

Two-Day



KMR240 Cable Signal Loss and VSWR									
Frequency	3FT	6FT	10FT	15FT	20FT	25FT	35FT	50FT	VSWR
1500MHz	0.29	0.58	0.96	1.44	1.92	2.4	3.36	4.80	≤1.15

Electronic Components

LNA (Low Noise Amplifier)



Nooelec SAWbird+ H1 - Premium Saw Filter & Cascaded Ultra-Low Noise Amplifier (LNA) Module for Hydrogen Line (21cm) Applications. 1420MHz Center Frequency. Designed for Software Defined Radio (SDR)

[Visit the NooElec Store](#)

4.4 ★★★★★

62 ratings

[Search this page](#)

\$44⁹⁵ (\$89.90 /100 g)

SDR (Software Defined Radio)



NooElec NESDR Smart XTR SDR - Premium RTL-SDR w/Extended Tuning Range, Aluminum Enclosure, 0.5PPM TCXO, SMA Input. RTL2832U & E4000-Based Software Defined Radio

[Visit the NooElec Store](#)

4.3 ★★★★★

189 ratings

[Search this page](#)

\$43⁹⁵

[prime](#) Two-Day

FREE Returns

Align Antenna and tie down with string & tent pegs

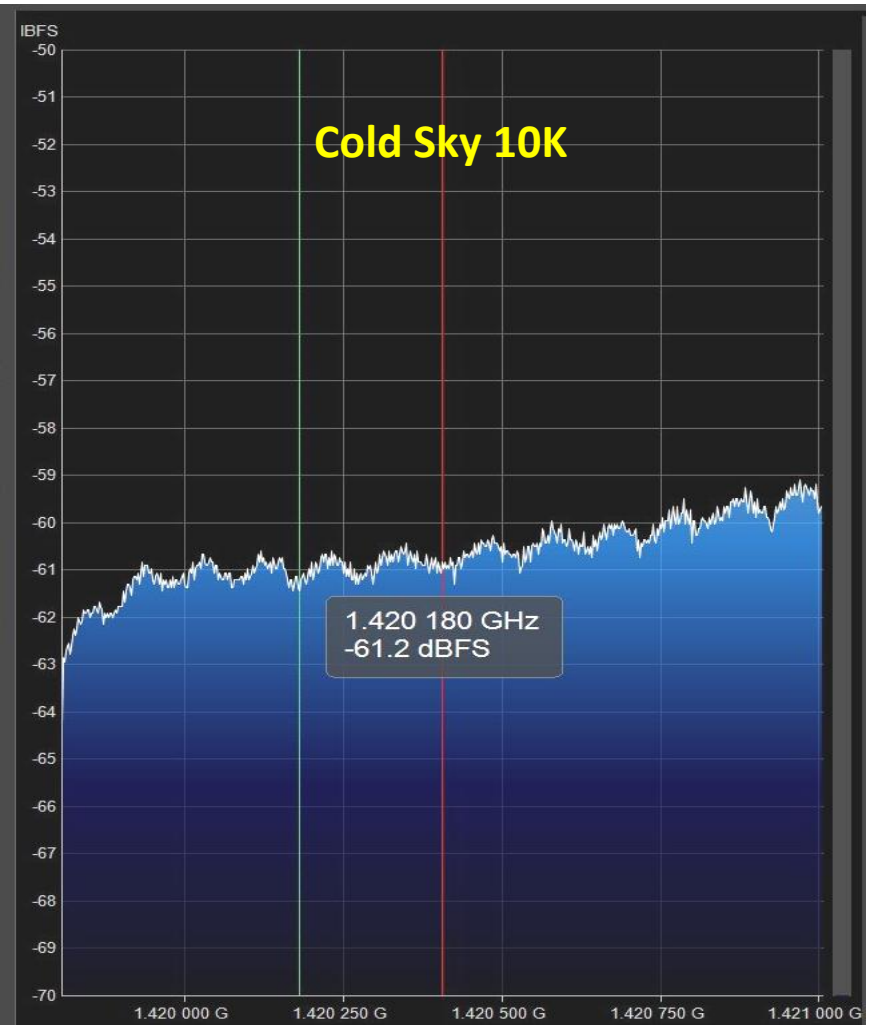
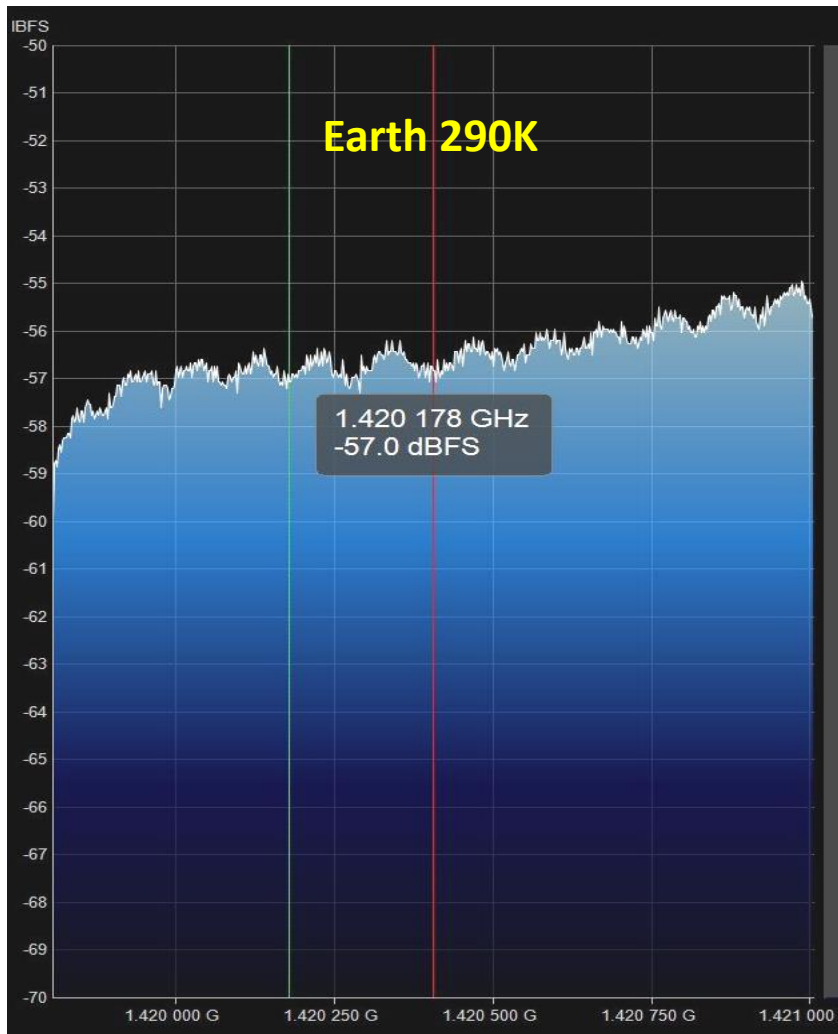


Performance Verification Test

-57 dB

< Delta 4.2 dB >

-61.2 dB



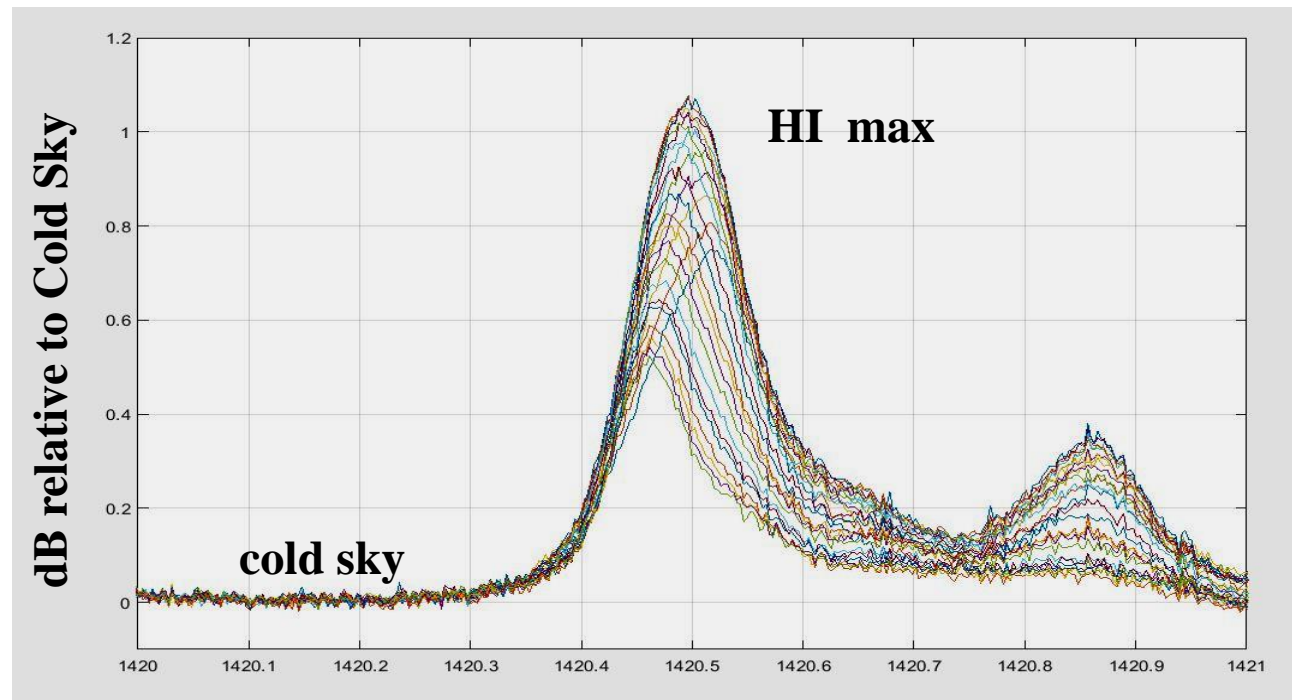
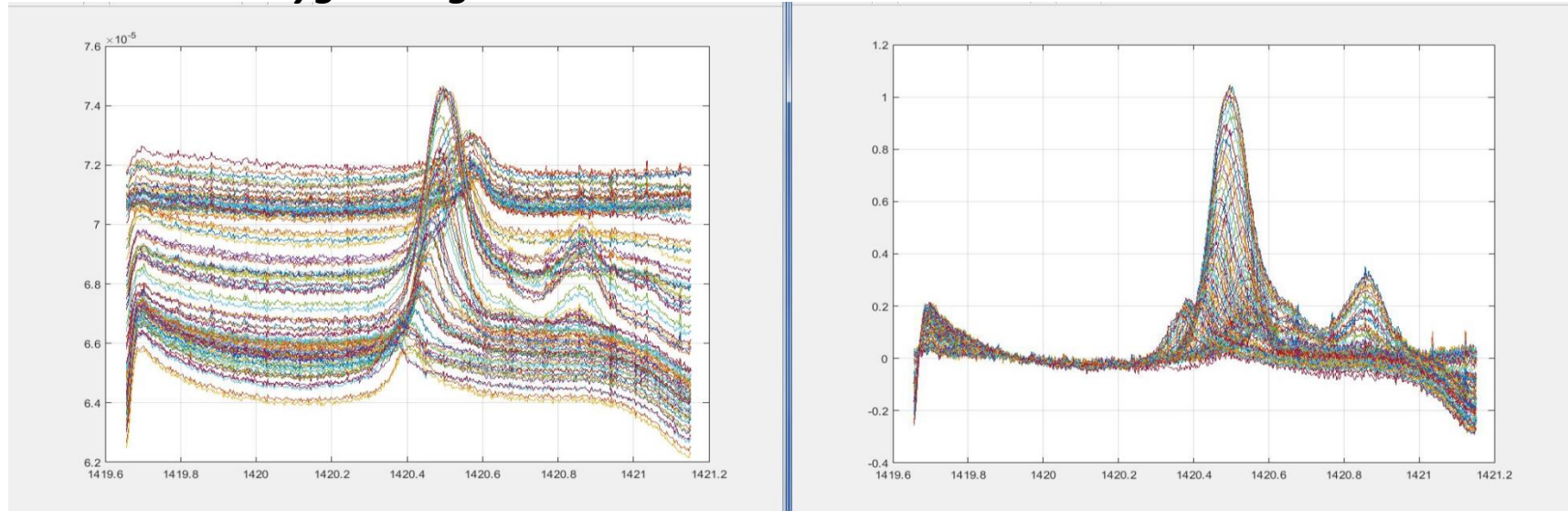
Declination + 40 Deg RA 20:30 Hrs



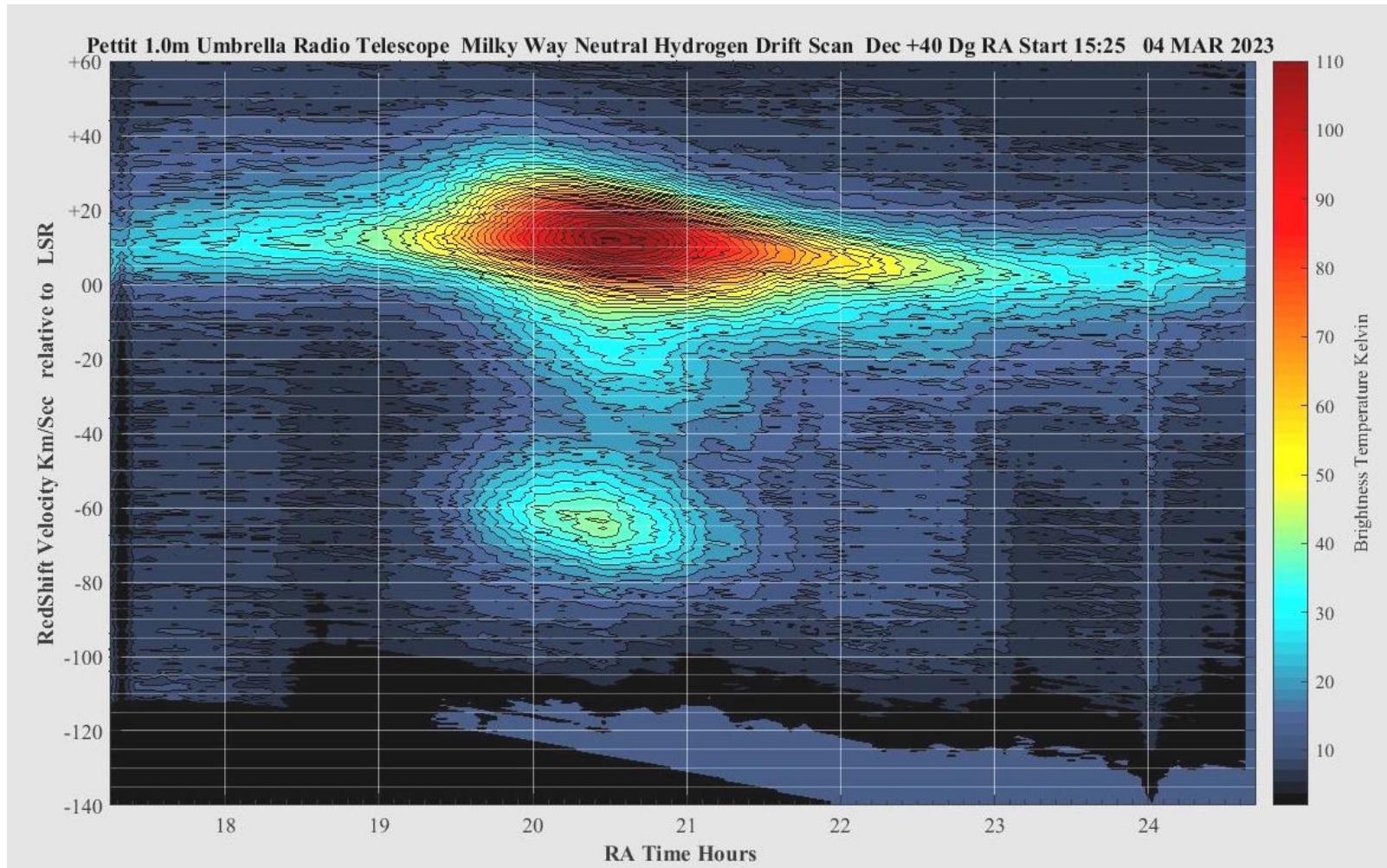
Drift Scan of Hydrogen Clouds in Milky Way

Cygnus region

105 ea 5 minute / sample Scans



Declination + 40 Deg RA 20:30 Hrs



A Pettit 1m Photo Umbrella Antenna Dec +40 RA 20:30 Hrs @ 21 cm

