Spectral Hydrogen, Continuum and Methanol Data Results, On Various Aperture Antennas

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Data may be displayed using conventional methods such as DOS, Windows Excel, or customized software for the system in use. In addition, data results will vary with different antenna types and aperture.

The Antenna **-** For instance, the resolving power of a 26 meter dish antenna will be much greater than that of a smaller aperture antenna. Taking a note from the optical astronomy community, a reflector type mirror measuring 12 inches diameter, will gather more light that one measuring six inches diameter. This is the same analogy with antennas.

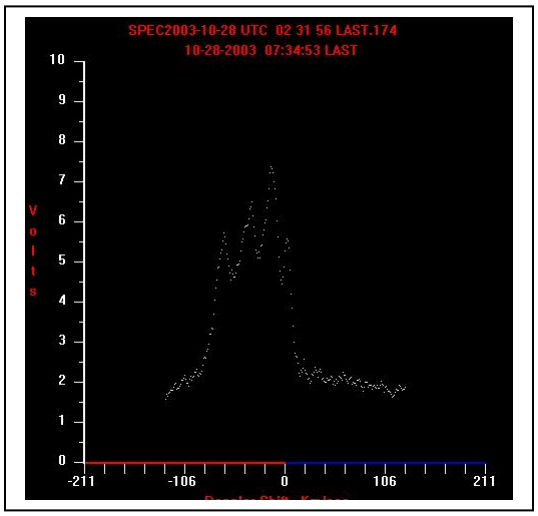
When trying to resolve Hydrogen clouds at 1420.405 MHz, using a three meter dish antenna, one will be able to resolve multiple clouds. When using a 1.6 meter antenna, he same objects will be seen but, they will appear as a single object.

Analog to Digital Data Conversion Method **-** Also referred to as quantisation. A process in which a continuous signal is converted to a series of points at discrete levels and converted to a series of binary integers. The receivers in use are,12 Bit Technology.

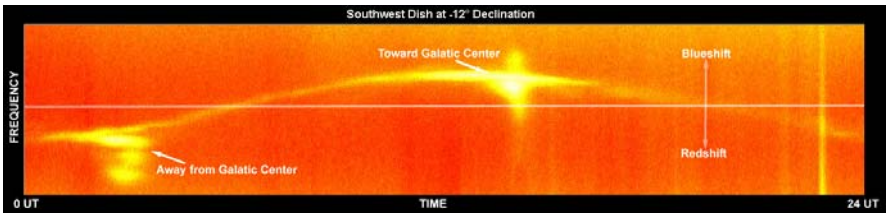
The results pictured below were all done on a Spectral type receiver (RAS SpectraCyber™ or UltraCyber™) and using different size antennas. Again, results may vary from the receiver used by the observer. ie; ICOM8500 or RAS SpectraCyber™, as well as, the software and signal processing methods. In addition, the RAS receivers have superior image rejection.

RAS SpectraCyber™ and UltraCyber™

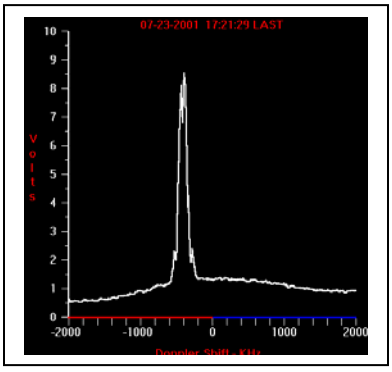
Antennas used for Observations
Left - 1.6 meter (Villa RO), Center – 5 meter (PARI), Right – 26 meter (PARI)

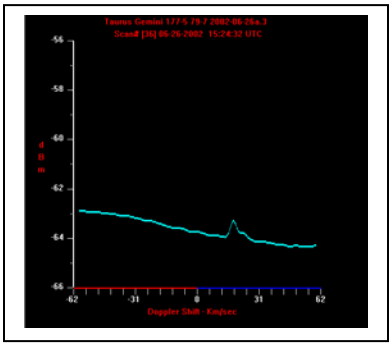


Spectral Hydrogen captured on a 7.5' diameter Antenna
(Carl Lyster at NRAO)

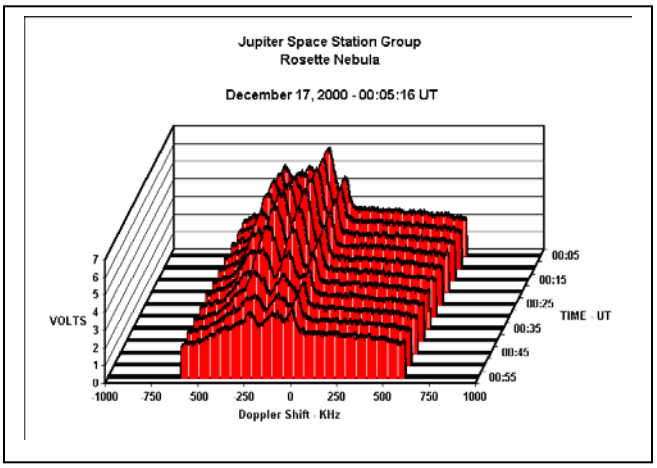


SpectraCyber™ FirePlot – Modified SpectraCyber™ Software
(Stephen F. Austin University, Michael Johnson and Dan Bruton)
http://www.physics.sfasu.edu/observatory/radio/radio.html

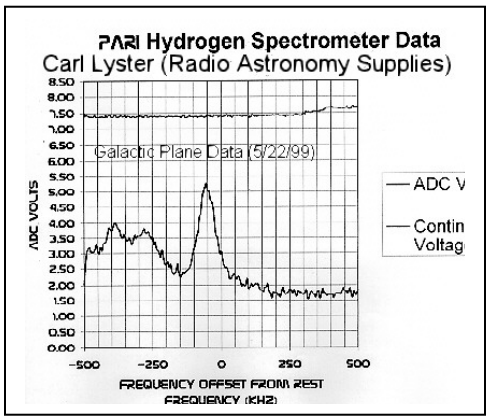


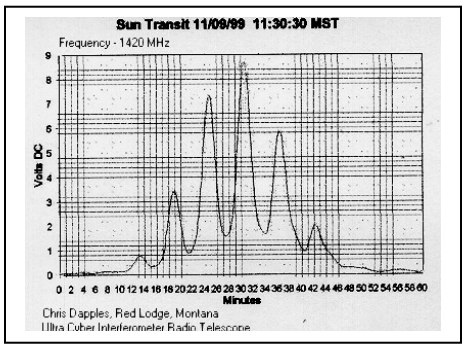


Methanol @ 6.6 GHz and Methanol @ 12 GHz
3 meter antenna with a Methanol Converter and the SpectraCyber™
(Dr. John Bernard)

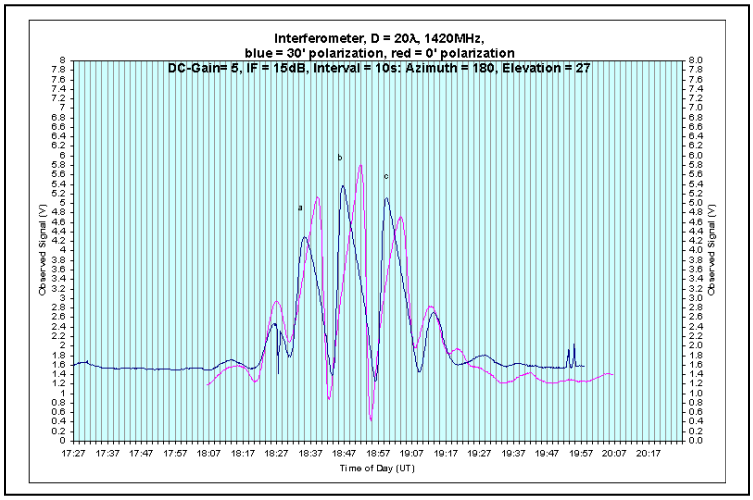


Software Presentation of a Spectral Scan in EXCEL
(Dr. John Bernard)





Spectral Hydrogen – 5 meter (PARI), Right – Chris Dapples (UltraCyber™ Interferometer)



Solar Scan SpectraCyber Interferometer – Rodney Howe

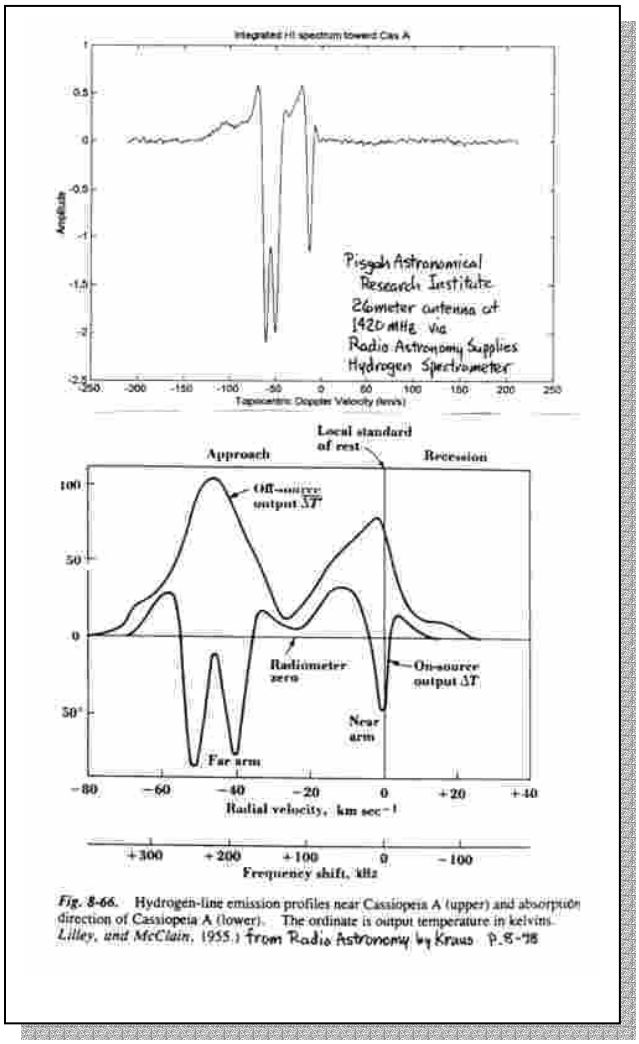


Fig. 8-66. Hydrogen-line emission profiles near Cassiopeia A (upper) and absorption direction of Cassiopeia A (lower). The ordinate is output temperature in kelvins. *Lilley, and McClain,* 1955.) from Radio Astronomy by Kraus P.8-78

Spectral Hydrogen on a 26 meter Antenna (PARI)
Comparison with Text Book Results ie; Dr. John Kraus