

IAF SYMPOSIUM ON FUTURE SPACE ASTRONOMY AND SPACE PHYSICS MISSIONS (A7)
Technology Needs for Future Missions, Systems, and Instruments (3)

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OBSERVING AT 1.4 GHZ WITH THE SHARJAH NEW 40-M RADIO INTERFEROMETER

Abstract

As part of its educational program to introduce radio astronomy in its curriculum, the Sharjah Academy for Astronomy, Space Sciences, and Technology has constructed a 40-m radio interferometer to be used at 1.4 GHz, the frequency of neutral Hydrogen emission. The system is made of three SPIDER 500A 5-meter telescopes. To avoid visibility redundancy, the three telescopes were placed at the vertices of a right scalene triangle with distances (sides of a scalene triangle) of 30, 40, and 50 meters. This array will be able to simulate the resolution of a 40-m diameter single-dish antenna, with a collecting area equal to an antenna of 8.7 meters in diameter. The synthesized beam in this configuration measures about 0.36 degrees (21.6 arc minutes). The project started with the installation of the first SPIDER 500A in mid-2019, and the remaining two by the end of 2019. Radio Observations at 1.4 GHz are very important. We plan to map the overall spiral structure of our own Galaxy by observing the Hydrogen line emission. It will also be possible to calculate the rotation curve of our Galaxy to figure out the relative speed of each arm. With the arcminute resolution, we plan to do large surveys of the extended extragalactic radio sources. As part of the SETI program, we plan to use the radio interferometer to search for signals from potential extraterrestrial civilizations since the 21 cm hydrogen line is considered a favorable frequency for communication. This paper will discuss the construction of the 40-m radio interferometer and the observing program that is being implemented.