

A 32 m Parabolic Antenna in Peru At 3,370m of Altitude

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Abstract. At the altitude of 3,370 m on the Peruvian Andes, a 32m antenna owned by the telecommunications company Telefónica del Perú will be transformed to a Radio Telescope, it would be transferred to the Geophysical Institute of Peru (IGP). The parabolic antenna was constructed in 1984 by Nippon Electric Co. (NEC) and worked as an INTELSAT station until 2000. A team of the National Observatory of Japan (NAOJ) evaluated the antenna in 2003 and reported its availability to be used as a Radio Telescope. In collaboration of the NAOJ a 6.7 GHz receiver is under construction and will be installed within this year. Initially the telescope as a single dish will monitor and survey Methanol Maser of YSO, higher frequencies equipment and VLBI instruments will be considered. The antenna will be managed by the IGP and used by universities in Peru, becoming a VLBI station will be a grate contribution to astronomy and geodetic community.

1. The Antenna

The INTELSAT station was built between 1984 and 1985 by the ENTEL-PERU (Empresa Nacional de Telecomunicaciones - Perú) the national communications enterprise of Peru, the antenna system was built by the Nippon Electric Co., and then in 1993 the national telecommunications enterprise was transferred to the private company Telefónica del Perú. In 2000 the antenna station stopped operations as an INTELSAT station.

Actually the antenna station belongs to this private company and negotiations are in progress to transfer the antenna station to the IGP.

2. Location

The Sicaya antenna station is located on a small hill in a beautiful open flat valley that is similar to Owens Valley in California or Nobeyama in Japan where world famous radio observatories are located. The antenna looks still in very good condition without no apparent rust probably due to its location at 3,370 m of high altitude and being far away from sea side. The structure of the antenna is well suited to upgrade receivers in future.

Latitude: -12°02'15",
longitude: -75°17'39",
altitude: 3,370 m.

Weather:

Annual precipitation: 700 mm in average,
average temperature: 12°C,
average humidity: 61 %, no snow.

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** Retired

3. First Step

As the first step the antenna will be equipped with a 6.7 GHz receiver. The 6.7 GHz receiver is under construction and planed to be ready for this spring.

Initially we are planning to monitor and survey Methanol masers on Young Stellar Objects. Methanol masers are good tracers around the young objects that can be used to disentangle unknown physical conditions of stellar surroundings.

4. VLBI

Once the antenna is equipped and allowed to observe at higher frequencies, it will became an important VLBI station in South America, due to the unique location and altitude will contribute enormously to for instance the VLBA array (Horiuchi et al. 2003). In the future it will become a promising geodetic station.

5. Conclusion

The 32 m antenna in Peru will be transformed into a radio telescope. As the first step, as a single dish telescope the antenna will be equipped with a 6.7 GHz receiver to monitor and survey methanol masers of Young Stellar Objects. The antenna will become a powerful mean to develop and settle radio astronomy in Peruvian institutions and universities. In the future, receiving higher frequencies and participating as a VLBI station are in mind.

References

Horiuchi, S., Murphy, D., Ishitsuka, J., Ishitsuka, M. 2003, Potential Improvements to VLBA u-v Coverages by the Addition of a 32m Peruvian Antenna, at Future Directions in High Resolution Astronomy - A celebration of the 10th Anniversary of the VLBA, Socorro, New Mexico, USA.



Fig. 1. The 32m Sicaya antenna is located at the altitude of 3,370 m on the Peruvian Andes.