

JELEBU OBSERVATORY REPORT

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Abstract

The idea of building the Jelebu Observatory was first planned in 2005. After some extended radio frequency interference (RFI) survey and deep discussion with local administrators near the site, a concrete plan is now being made. The observatory will cover low-frequency observations of solar radio astronomy and will host a medium-sized radio telescope for hydrogen and formaldehyde spectral line observations. The main science goals will be to study Active Galactic Nuclei, Galaxy Clusters and Cosmology. The report will include the status of the early planning as well as early construction progress of the observatory.

Keywords: Radio Astronomy, New Observatory, Cosmology

Introduction

The importance of radio astronomy research in Malaysia has increased significantly over the last few years. This is due to the emergence of financially backed projects by University of Malaya, the Ministry of Science, Technology and Innovation of Malaysia and the National Space Agency. Most early works involve studying radio frequency interference (RFI) in selected sites. A few sites are also pinpointed as potential radio quiet zone. One of the sites is the Jelebu site. It is located about 80km off Kuala Lumpur, the capital city of Malaysia.

Methodology

RFI testing was done at the Jelebu site. Testing was done covering frequencies up to 18 GHz. We also focused our testing around radio frequency windows protected by the international telecommunication union (ITU) for the purposes of radio astronomy. We gave more attention to Hydrogen and Formaldehyde spectral lines as those are the main science goals that we have in mind for the eventual radio telescope when it is constructed at the site. The soil testing was also done at the site.

Results and Discussion

We found that the RFI level is very low and most of the protected windows are free from them. Although it limits some sky coverage, the mountain range surrounding the site gives a good protection from the nearby cities. The significance of a very long baseline interferometer (VLBI) station at the site is also a great motivator for the construction of the radio telescope at this site.

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References

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