



Two New 3-Band Solar Radio Polarimeters

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Extended Abstract

It is an important method of space weather predictor to monitor the solar flux continuously in long-term with the ground-based solar radio telescopes. Solar flux is one of the most useful observable indexes for predicting kinds of turbulences occurred on the earth excited by the Sun activities and solar ultraviolet radiation. It represents the solar total activity level, especially the 10.7cm solar flux, which has long been used as solar activity index since 1960s.

With the financial support of NSMC (National Satellite Meteorological Center) and NAOC (National Astronomical Observatories), two new 3-band solar radio polarimeters used to monitor the solar flux working on three wavelengths (10.7cm, 6.6cm and 3.3cm) have been set up on December 2016, in Mingantu Observatory of NAOC in inner Mongolia (MAT) and in Tashkurghan in Xinjiang, China. The two telescopes will give more time coverage to observing the sun with the distance between these two sites is about 5000km and 2.5hour zone away.

On account of the unfavorable weather condition of the two sites, some measures such as thermostat on the front end are employed to maintain the system stability, better than 1% in over 10 hours, and system sensitivity is better than 1 s.f.u. ,with 10MHz bandwidth and 0.1s integration time.

The system includes four inputs: the right hand and left hand polarization signal from the sun, a noise source and a 50ohm load. The noise source and a 50ohm load used for daily calibrator are also mounted in the thermalized front end.

The electromagnetic environment is much better in MAT than in Tashkurghan, because many EMC measures have in adopted in MAT, while the Tashkurghan site, is located very near the town.

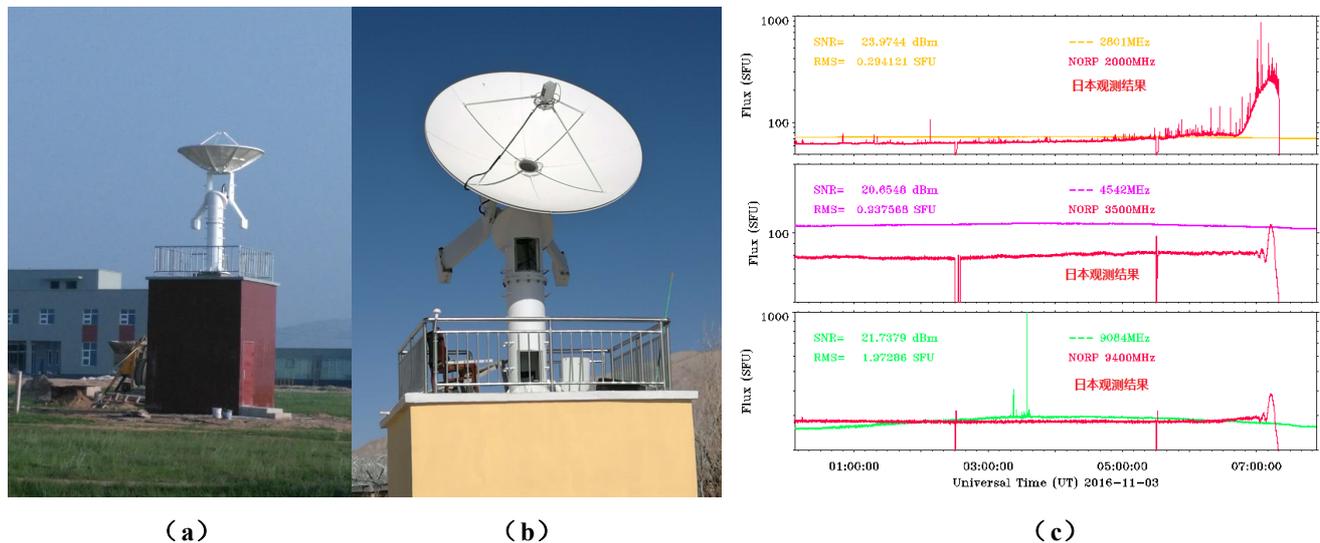


Figure 1. (a) MAT telescope(42.22°N, 115.24°E,1356m H); (b) Tashkurghan telescope (37.78°N, 75.23°E,3091m H) ;(c) preliminary result of MAT telescope on 3-band compared with than of similar telescope in Japan.

References

1. Chengming Tan, Yihua Yan, Baolin Tan, et.al. “Study of calibration of solar radio spectrometers and the quiet-sun radio emission”, APJ, 808:61(14pp), 2015 July 20,doi: 10.1088/0004-637X/808/1/61