



Future prospects in China for the observations of interplanetary scintillations

Yihua Yan^(1,2), Wei Wang⁽¹⁾, Linjie Chen⁽¹⁾, Fei Liu⁽¹⁾, Lihong Geng⁽¹⁾, and Zhijun Chen⁽¹⁾

(1) CAS KLSA, NAOC, Beijing 100101, China, e-mail: yyh@nao.cas.cn

(2) School of Astronomy and Space Sciences, University of CAS, Beijing 100049, China

The Interplanetary Scintillation (IPS) of compact radio sources at meter to centimeter wavelengths is a useful ground-based method to investigate solar wind structure and parameters. The available facilities for IPS observation include single station with large telescope/array, or multiple stations with intermediate size of antennas. To combine advantages of the single station and multi-stations, we propose a new design for the IPS telescope with large collecting area at one main station and small antennas at other sub-stations. This new IPS telescope concept is a part of the Phase-II Meridian Space Weather Monitoring Project under the 2016-2020 National Infrastructure Program in China to be constructed in near future.

At main station, there are 3 cylinder antennas placed side by side, with large reflector size for each cylinder of 140m in N-S direction and 40m in E-W direction. In order to scan the sky quickly and for other scientific targets, the cylinder antennas are designed to be rotatable in the E-W direction, but do not need tracking because of limited budget. Therefore they can be set to point to a direction in short time and wait for the passing of the IPS sources.

At each sub-station, there is a ~16m parabolic dish antenna with cryogenically cooled receiver. The antenna is azimuth-elevation mounted. Due to the size of each feed, a rotated feed support structure is considered. One side of this structure is for 327MHz and 654MHz feeds, and the other side is for 1420 MHz feed. Some relatively strong radio sources can be observed.

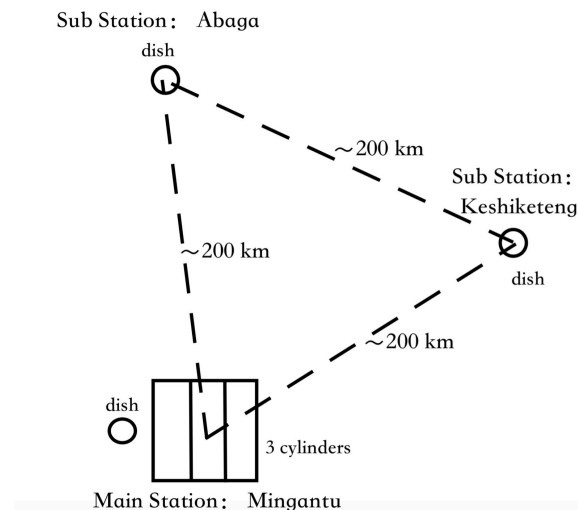


Figure 1. Schematic distribution of the IPS Telescope Array

Profs. Ramesh and Manoharan, Xueshang Feng, Ming Xiong, Jiansen He, and Dr. Lijia Liu are acknowledged for comments and suggestions to improve the design for this IPS telescope. The work is supported by National Natural Science Foundation of China grants 11433006, 11790301, 11773043, and the Meridian-II Project under National Infrastructure Program in China.