

Status Report of Syowa East and Syowa South Radars

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1. Syowa East Radar

Syowa east radar operated without any major problem all through the year in 1999-2000 with a good amount of backscatter.

2. Syowa South Radar

After one and a half year of pause, Syowa south radar started operation again in February 1999 with a newly installed antenna array (Create Design Corp. Model CLP8020). Fairly good echoes were observed in the period of March-September 1999. However, the system sensitivity was degraded in the period of October 1999-March 2000 due to a trouble in the high power T/R switches. There was an improper use of the PIN diodes in these switches when they were repaired at Syowa Station, and the transmission loss was increased in the receiving mode. These T/R switches were repaired again in March 2000 and the south radar recovered to normal sensitivity afterwards.

3. Interference to Syowa MF radar

An MF radar was newly installed at Syowa Station in March 1999. As Syowa Station is located on a small island of 2 km by 1.5 km, it is difficult to have a distance between the MF radar and the HF radars to be longer than 1 km. The MF radar suffered a severe interference from the HF radars since its initial operation. We tried to remove the interference by data processing in the MF radar in 1999. The interference was completely cleared away in January 2000 by installing high power high-pass filters at each output of the 600W power amplifiers of the HF radars.

4. Preparation for the interferometric observation

For Syowa south radar, a sub array antenna was installed in 1995 for the interferometric observation. However, there are several problems to be solved before we can start interferometric observation. They are;

- 1) Center of the sub array was not on the center line of the main array, because a big rock prevented the antenna bases to be installed at the right position.
- 2) High-pass and low-pass filters are installed between the antennas and the power amplifiers for the main array to reduce spurious noise. There are no such filters for the sub array, and this asymmetric setting produces improper phase delay in interferometric observation.
- 3) Antenna cable length for the main array and the sub array becomes not equal after several times of system change (renewal of the main array antennas, removal of the power amplifiers from the foot of the antenna towers to inside a hut, rotation of antenna beams toward Halley by 6 degree by inserting a tapered-length delay lines for the main array).

For 1), we removed the sub array antennas to the right position in February 2000.

For 2), we will install the high-pass and low-pass filters for the sub array antennas in January 2001.

For 3), we will return the antenna beam direction to original position by removing the tapered-length delay lines, and adjust the antenna cable length of the both array using a Time Domain Reflectometer in January 2001.

We hope to start interferometric observation for Syowa south radar in the year 2001.