

## Development of unmanned auroral observation system: Operation at Amundsen Bay

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Space and upper atmospheric sciences group in the National Institute of Polar Research (NIPR) is now developing a new Unmanned Auroral Observation system (UAO), which is equipped with a 3-axis fluxgate magnetometer, all-sky auroral imager, and GNSS/TEC receiver, in the current 9<sup>th</sup> term Japanese Antarctic Research Expedition (JARE) programme. Electric power of the system is supplied by a hybrid natural energy electric generation system which consists of three sets of 192W wind generators and 8 sets of 62W solar panels. Observation data are stored in a memory card in the system box and also are transmitted via the Inmarsat satellite data communication system to a server in Japan by FTP.

One system of the UAO (UAO-1) was installed at Syowa Station by the 57<sup>th</sup> JARE in January, 2016, and had been operated until November in 2016 to do a system check before deployment. All the instruments had been normally functioned all through the period without any interruption even during the polar night period. The UAO-1 had been deployed at Amundsen Bay area, which is located about 500 km eastward from Syowa Station, in February, 2017 in the summer operation of the 58<sup>th</sup> JARE (attached Figure), and started its continuous operation. Due to an insufficient wind speed at the Amundsen Bay site, the system stopped its normal operation and moved into a standby mode from 17 May until 22 August including the polar night period. The UAO-1 re-started its normal operation after that period after the electric power supply by the solar generator increased enough. In our presentation, we will talk about a brief summary of the UAO and the operation results at Amundsen Bay.

Keywords: aurora, unmanned observation, Antarctic

