

## **Auroral conjugate observation network in Antarctica using unmanned system: Current status and future perspective**

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Space and upper atmospheric sciences group in the National Institute of Polar Research (NIPR) is now constructing an observation network for auroral phenomena along the coast of the Dronning Maud Land in the Antarctica including Japanese Syowa Station (SYO) under the Japanese Antarctic Research Expedition (JARE) program, and has developed a Unmanned Auroral Observation system (UAO), which is equipped with a 3-axis fluxgate magnetometer, all-sky auroral imager, GNSS/TEC receiver, and a data communication system using the Inmarsat satellite data link with a low power consumption. The first UAO (UAO-1) had been installed at Amundsen Bay area (AMB), which is located about 500 km eastward from SYO, in February, 2017 in the summer operation of the 58th JARE. The second UAO (UAO-2) had been installed at Belgium Princess Elisabeth Antarctica Station (PEA) in January, 2020. In January, 2020, we had also installed an auroral imager system at Indian Maitri Station (MAI), which consists of four sets of all-sky imager using Watec cameras: 1) Panchromatic (color) ; 2) Panchromatic (black&white); 3) filtered at 560nm (FWHM:10nm); 4) filtered at 632nm (FWHM:10nm), respectively. PEA is maintained during summer season, and becomes an unmanned station during winter season, while the electric power to all the instruments at the station is supplied continuously all through the season. Maitri is a year-round station. Now we are planning to install the similar auroral imager system at South African SANAE station as at MAI in near future. As for the instruments at SYO, we have newly installed the similar monochromatic all-sky imager system using four sets of Watec camera (WMI: Watec Monochromatic Imagers) as at MAI in December, 2022, and started its observation from February, 2023 in the frame of the monitoring observation in the tenth phase of JARE. We have also carried out the unmanned magnetometer network observation at several open-air points along the coast near SYO and along the route to Dome Fuji station in the Antarctic continent, so far. In our presentation, we will talk about the current status and future perspective of these network observations, referring the observations in Iceland in the context of the interhemispheric conjugate observation network.