



Incorporation of satellite telephone data link into unmanned low power observation system in Antarctica

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Difficulty of unmanned observation in the polar region is caused by long dark winter period in which solar cell can not be used. One solution for this difficulty is to minimize the power consumption of the system as small as 1W to get through the winter season with limited amount of batteries, such as the low power magnetometer (LPM) developed by British Antarctic Survey (BAS). Another difficulty of unmanned observation is to collect data from the observation site. It is quite expensive to send personnel to the observation site by aeroplanes, or snow motors to collect the data. It is much inexpensive to collect the data via satellite data link by installing a telephone terminal into the observation system. It seems difficult that the power consumption of a satellite telephone terminal is about 10W, which is much larger than the available power of the low power system. However, as long as the observed data is within a few Mbyte per day, there is no problem because the transmission is necessary for a limited time period of a day, and daily average power consumption lies within the available power. We have developed a low power observation system with Iridium telephone data link for the magnetometer and VLF wave observation in Antarctica. Basic design concept of the low power system is similar to BAS LPM with some improvement in the power consumption and noise level. Satellite telephone data link is only used in sunlit season and the total power consumption of the system is 1W (0.8W for the data link). Observed data in the dark winter period is stored in CF memory with diminished power consumption, and they are transmitted in spring time together with the near real-time data. Our experience from VLF observation in 2006 and magnetometer

observation in 2007 will be reported along with some initial observational results.