SNOWWEB 3.0

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SNOWWEB is an ongoing project to develop and deploy a network of wirelessly connected environmental monitoring stations to measure localised atmospheric phenomena at high resolution in Antarctica. Currently available meteorological measurements in Antarctica have a very coarse spatial resolution which makes SNOWWEB a valuable tool. This lack of high resolution data at a local scale presents an excellent opportunity to collect said data and use it to investigate localised atmospheric phenomena in greater detail to gain a better understanding of the physical processes involved. The data captured can also be used to validate remote sensing and model datasets as well as to increase the accuracy of weather models in the areas of deployment. The SNOWWEB wireless network uses a mesh topology – where each node is in range of at least 2 other nodes – to robustly shuttle real-time information from all nodes through the network to reach a single base station which enables remote monitoring and control from a single point. Key features of SNOWWEB stations are low unit cost, minimal unit configuration, and fast deployment/recovery times which make it easy and cost effective to deploy large numbers of stations to a given area for months at a time before recovering them for re-use elsewhere. Current SNOWWEB stations measure wind speed and direction, temperature, relative humidity, air pressure, and location via GPS (for ice movement studies) and can be deployed in the field using a 'guyed mast' setup in under half an hour with zero in-field configuration and instant wireless connectivity. Last summer a team of three deployed 12 SNOWWEB stations in an area near Scott Base over the course of three days for a test period of two weeks then retrieved them over two days. During the test period the wireless network transferred greater than 99% of expected data at 10 s intervals for each station. GPS data collected was post-processed on a daily time step to cm-scale resolution for use in calculating movement of the McMurdo Ice Shelf. Previous deployments have distributed up to 18 nodes and the measurements from these nodes have been used for comparison with AMPS forecasts in the vicinity of Hutt peninsula.