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UAV observations of the wintertime boundary layer over the Terra Bay Polynya, Antarctica

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Aerosonde unmanned aerial vehicles (UAVs) were used during September 2009 to observe the atmosphere and ocean / sea ice surface state in the vicinity of the Terra Nova Bay polynya, Antarctica. These flights were the first wintertime UAV flights ever made in the Antarctic, and were also the longest duration UAV flights made to date in the Antarctic, with a maximum flight time of over 17 hours. A total of 130 flight hours were flown during September 2009, with a total of 8 science flights to Terra Nova Bay. The flights took place at the end of the Antarctic winter, in an environment characterized by strong katabatic winds and strong air-sea fluxes. Observations of the boundary layer evolution of the katabatic winds propagating over the Terra Nova Bay polynya will be presented. The advantages of using UAVs for boundary layer observations in remote locations as well as the logistical challenges of operating UAVs in the Antarctic winter will also be presented.