Geophysical Research Abstracts
Vol. 14, EGU2012-3975, 2012
EGU General Assembly 2012

The Gust SODAR

S. Bradley
University of Auckland, Physics, Auckland, New Zealand (s.bradley@auckland.ac.nz)

Obtaining gust information has been challenging for SODARs because of the time taken for a sound pulse to travel to a typical range of 200 m and back. With three beams to obtain vector wind components, the maximum sampling rate is one wind profile every 3 s. Typically, averaging over a number of profiles means that wind profiles are obtained on time scales of minutes.
We describe a new design, a "gust SODAR", which overcomes these timing problems. This is achieved by continuous transmission of sound, using a repeating series of short pulses each having a different acoustic frequency. Continuous reception and analysis of the individual pulse data in the pulse stream is made possible by using physically and acoustically separated transmitter and receiver.
While conceptually this is simply successive processing of convention SODAR pulses, the real advantages of this new design arise from putting together the stream of wind vector components so that the signal-to-noise ratio is dramatically improved.
The basic sampling rate is determined by the duration of the pulse steps. As an example, we describe the initial results from a system comprising 20 step changes in frequency over a 1 s interval, producing wind profiles every 50 ms.