

Scaling TODWL and GWOLF performance to space

G. D. Emmitt and C. O'Handley
Simpson Weather Associates

Working Group on Space-based Lidar Winds
June 28- July 1, 2005
Welches, Oregon

Parameter	TODWL (*)	Space-based (800 km)	Signal Ratio
Energy/pulse (mJ)	4	250	62.5
Telescope diameter (cm)	9	23	6.5
System total efficiency	8 (~)	12	N/A
Shots accumulated (#)	40	120	1.73
Number of range gates integrated (#) for .5 km	1	12	3.4
Attenuation (hardware) (dB)	5	0	N/A
Signal strength (dB)	15	2 **	20
Range to target (km)	2.32	981	.00000559
Total scaling			.27 (.41) ***

* assumes TODWL at 3 km looking down at 30 degrees to 1km (msl).

** assumes that a good estimate can be obtained from a signal with SNR of 2 dB.

*** () would be the case if space system efficiency was 1.5X that of the current TODWL system.

Issues

- What does the 5dB attenuation used in TODWL mean in the inversion?
- What is the threshold SNR for 50% detection?
- What is the actual efficiency of the TODWL system?
- What was the beta at 1km?