

Test of shooting boom angles

I just set up a test with the digital theodolite in the far east parking lot. I chose to shoot SN0853, which had been used as "1b" in AHATS. In Tom/Rudy's plots, this shows a mean wind direction anomaly of about 4 degrees.

I set the sonic up on the TRAM tower, facing the gate.

I set the theodolite up near the gate (about 34m according to GoogleEarth).

For my reference heading, I shot a recognizable tree on the Olde Stage ridgeline (about 6km away). I moved the theodolite generally along the bearing to this tree, say within 10cm, so this reference heading should be good to $\text{atan}(0.1/6000) = 3.5^\circ$ of arc.

The array obviously was not exactly square, so I shot it three different ways, to be more-or-less representative of the variations that might be used.

Shooting the "u" transducer pair, I got 94d 38' 35" for the relative angle to the tree.

Shooting the top tube, I got 94d 43' 49" (essentially the same as the transducer pair).

Shooting the center of the bottom "u" transducer 90degree bend with the bracket at the bottom of the vertical strut, I got 93d 55' 39" -- just 0.7degree different.

Thus, I conclude that, although the array is not perfect, the magnitude of the geometry variations are less than 1 degree, which cannot explain the 4 degree differences that were observed in the field.