

Measuring & Removing Tiltmeter Bias

Tech Note

Tiltmeter bias (B) as defined here is the difference between the true angle and the angle reported by the tiltmeter. Think of a perfectly horizontal surface with an AGI tiltmeter sitting on it. If there were no bias, then the tiltmeter output would read 0 degrees (assuming bipolar output). However, tiltmeters will read something different than the ideal 0 degrees on a perfectly horizontal surface because of mechanical tolerances in the component parts (base plate, screws, standoffs, etc.).

To measure and remove bias, do the following:

1. Place the tilt sensor on an approximately horizontal surface (table top, granite flat, etc.). Read the indicated angle, THETA1. For voltage output tiltmeters, $THETA1 = V \times S$, where V is the voltage and S is the scale factor reported in the user's manual.
2. Rotate the tiltmeter 180 degrees on the surface so that it is facing the opposite direction. Read the indicated angle THETA2
3. $B = (THETA1 + THETA2)/2$. Record B and subtract it from all subsequent measurements to get the true angle.
4. For biaxial tiltmeters biases for both tilt axes, B_x and B_y should be measured.

