Resolving Short Term Variations in the Calibration Parameters for Accurate Determination of Vector Measurements from a Single Spinning Spacecraft.

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For accurate determination of vector measurements 12 calibration parameters are required for each spacecraft. For spinning spacecraft, eight of the calibration parameters can be resolved by least squares techniques that minimize the first and second harmonics of the spin frequency in the data. For the correct application of this technique, the input parameters must cover as large a range as possible; therefore the analysis must be applied over a long time interval in which the input data go through a large range (significant portions of a spacecraft orbit). Often, there are also short term variations in the calibration parameters which cannot be resolved with this least squares approach. Left uncorrected, these short term variations generate a variable signal at the first and second spin harmonics. We review the technique that we use for calibration and we demonstrate a new technique that corrects the calibration parameters to remove short term variations. The new technique is extremely useful in situations where an accurate assessment of spectral power is required in the data.