Table 2. Error quantum to be introduced to nominal values of parameters (Note: The values are only place holders)

ΔX (m)	ΔY (m)	ΔZ (m)	Δω (seconds)	Δϕ (seconds)	Δκ (seconds)	Mirror angle scale (unit less)	Range errors (meters)
–0.13	0.7	.17	17″	–18″	72″	0.13	0.7
–0.15	–0.14	0.05	11″	106″	5″	0.15	–0.14
–0.04	0.07	0.08	71″	129″	66″	0.04	0.07

errors from many sources, including boresigh parameters. The test plan involves selecting different sets of values for the boresight parameters and generating a test dataset. Volunteers (data providers) distributed a table (similar to Table 2), with three sets of errors to be introduced to the nominal parameter values, generating three data sets per volunteer. The amount of errors introduced to the boresight parameters will vary depending on discussions with data vendors.

The volunteer will store the data sets in separate folders, while maintaining a record of errors, and process the data sets with the DQM software tool. The output generated will be analyzed to obtain summary estimates of errors in different data sets. This analysis will be followed with discussions by the ASPRS Cal/Val Working Group members on providing summary statistics of errors in the data. The publication of results of the analysis will help the customers of data to correctly specify the quality of data for procurement and scientific applications. In the next few months, processes will also be developed to determine DQMs over planar features and DQMs over linear features. Simultaneously, the USGS will also lead the Cal/Val Working Group in identifying and testing targets for absolute accuracy assessment of lidar data. The geospatial community is invited to contact Aparajithan Sampath (asampath@usgs.gov) or Greg Stensaas (stensaas@usgs.gov) if they would like to participate in the process.

The ASPRS guidelines on Geometric Accuracy and Quality of Lidar Data will incorporate the results of the analysis. The development of DQMs can have additional applications. Currently, there exists no accepted method of geometrically comparing two lidar or other 3D datasets, collected by different vendors at different times. The DQMs will allow the lidar user community to identify baseline dataset and use DQMs to directly compare any lidar data set against the baseline data and determine its relative accuracy. This test may allow scientists to perform studies such as change detection, time series analysis etc. with the confidence that they are working with geometrically consistent datasets. It is expected that this USGS- led ASPRS research will result in an across-the-board improvement in the quality of lidar data processing. The new DQMs will provide the geospatial community with the capability to procure and acquire lidar data of high and quantifiable accuracy.

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