

Filtering enhanced traffic management system (ETMS) altitude data

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Abstract-

Enhanced Traffic Management System (ETMS) stores all the information gathered by the Federal Aviation Administration (FAA) from aircraft flying in the US airspace. The data stored from each flight includes the 4D trajectory (latitude, longitude, altitude and timestamp), radar data and flight plan information. Unfortunately, there is a data quality problem in the vertical channel and the altitude component of the trajectories contains some isolated samples in which a wrong value was stored. Overall, the data is generally accurate and it was found that only 0.3% of the altitude values were incorrect, however the impact of these erroneous data in some analyses could be important, motivating the development of a filtering procedure. The approach developed for filtering ETMS altitude data includes some specific algorithms for problems found in this particular dataset, and a novel filter to correct isolated bad samples (named Despeckle filter). As a result, all altitude errors were eliminated in 99.7% of the flights affected by noise, while preserving the original values of the samples without bad data. The algorithm presented in this paper attains better results than standard filters such as the median filter, and it could be applied to any signal affected by noise in the form of spikes.

Index Terms- Air Transportation, Traffic Management, Signal processing, filters

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