A modified Fuzzy C-Means algorithm application to SLR precise orbit determination

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In satellite laser ranging data processing, often the weighting scheme of station observations is subjective or even quasi-arbitrary, and a somewhat arbitrary cutoff of say 1m is applied prior to the data processing, which have an impact on optimal use of the available data. We apply a modified FCM algorithm to weighting the station according to the ILRS performance guidelines, namely, date quantity and date quality. We reprocess the LAGEOS data from year 2015 to 2017 by reweighting the station, the result shows an average improvement of 4.5mm in the RMS of the global POD solution. In addition, we make a combination of our sinex result with other analysis center, and we use Robust Variance Component Estimation to fix the weight for each analysis center, then we compare our combined result with the result offered by ILRS. It also shows that, after applying modified FCM algorithm to reweighting the station, the result have a better consistent with ILRS.