Performance Evaluation of Two Interpolation Techniques for GPS/BeiDou-Based Regional TEC Model

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SUMMARY

This study aims to develop a regional ionospheric model (RIM) based on the combined GPS/BeiDou observations over Europe. GPS/BeiDou observations from 16 reference stations are processed in the zero-difference mode. The bi-linear expansion function is used to model the vertical total electron content (TEC). Then, a least-squares algorithm is developed to determine the TEC parameters for a 15-minute time interval. In order to estimate the vertical TEC values at a 1º×1º grid, two different interpolation methods are used, including the inverse distance weighted (IDW) and the Kriging methods. To assess the accuracy of the developed model using those two methods, the vertical TEC values are estimated and compared with the international GNSS service global ionospheric maps (IGS-GIMs) counterpart. The findings reveal that the computed vertical TEC values from the developed models show agreement with respect to the IGS-GIM counterpart.