



## **Ionospheric modelling to boost the PPP-RTK positioning and navigation in Australia**

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This paper deals with implementation of 3-D ionospheric model to support the GNSS positioning and navigation activities in Australia.

We will introduce two strategies for Slant Total Electron Content (STEC) estimation from GNSS CORS sites in Australia. In the first scenario, the STEC is estimated in the PPP-RTK network processing. The ionosphere is estimated together with other GNSS network parameters, such as Satellite Clocks, Satellite Phase Biases, etc. Another approach is where STEC is estimated on a station by station basis by taking advantage of already known station position and different satellite ambiguities relations. Accuracy studies and considerations will be presented and discussed.

Furthermore, based on this STEC, 3-D ionosphere modeling will be performed. We will present the simple interpolation, 3-D Tomography and bi-cubic splines as modeling techniques. In order to assess these models, a (user) PPP-RTK test bed is established and a sensitivity matrix will be introduced and analyzed based on time to first fix (TTFF) of ambiguities, positioning accuracy, PPP-RTK solution convergence time etc. Different spatial configurations and constellations will be presented and assessed.