Time Series Analysis of Permanent GNSS Station Positions, Case Study: Western Canada

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SUMMARY

Summary:

This paper analyzes the position of permanent GNSS base stations in Western Canada over a period of 5 years to determine plate tectonic displacements. The control stations are located throughout British Columbia Canada. These stations are located near several oceanic and continental plate boundaries and faults. Further, the general plate motion models would also suggest there to be noticeable movement. These control stations have not had their coordinates updated in the last 6 years. The paper analyzes this network to determine whether the possible deformation between one epoch to another is statistically significant.

The results from this report shows an estimate for the magnitude, speed and direction of the movement of base stations. And based on these results, the report will show how frequent benchmark coordinates should be updated. Further, it discusses all possible systematic errors (tidal influences, precipitation, ext.) associated with GNSS data, and how those can be taken out of the new GNSS measurements.