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GPS multi-year campaigns for the deformation control in Northern Victoria Land (Antarctica)

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VLNDEF (Victoria Land Network for DEFormation control) project started in 1999 with the aim to detect crustal deformation in Northern Victoria Land. 5 GPS field campaigns have been carried out since then: 3 complete surveys of the network and other partial measurement repetitions.

In NVL the TNB1 GPS permanent station is working since 1998, in addition to the Cape Hallett remote station installed in 2004.

Relative and absolute displacements have been estimated using a local and a regional approach, both able to detect valuable movements and, the second, to refer the network to a global reference frame (ITRF2000). In particular, station coordinates in the global reference frame have been obtained by processing a core network of extra-Antarctic permanent stations and by combining together regional and local solutions. Robust and stable solutions for horizontal and vertical displacements were obtained.

The seasonal signals affecting GPS long-time series have been analyzed, overall on the vertical component, which is essential in order to detect effects, such as Post Glacial Rebound in NVL. Some comparisons have been carried out with reliable models available for the NVL area.