

# Common Position Changes of Collocated VLBI and GPS Stations

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## SUMMARY

The modern geodetic observations, based on high-accuracy space techniques, provide decadal time series of station coordinates. These time series are suitable to detect and research small ground motion due to local and global geodynamical sources. Some space technique stations are collocated and the comparison of their data may reveal common periodical oscillations and impulse variations due to global changes of gravity, earthquakes, climate and environment. Any different behavior of the time series of collocated stations should be interpreted as a restricted local ground motion, or as a systematic data error. The periodical and impulse variations of the coordinates of collocated VLBI and GPS stations at the observatory Wettzell are compared and analyzed. The data jumps are determined by means of a new useful high-sensitive method of impulse detection, which is able to estimate very small changes of mean data values and velocities. The periodical oscillations of the station coordinates are determined by means of partial Fourier approximation. The amplitudes and phases of common seasonal, 11-year and 22-year variations of Wettzell VLBI and GPS stations are compared. The mismatching jumps of station coordinates are interpreted as systematic errors due to the different observational techniques, and their effect on the periodical components is determined. This research may prove the reliability of modern geodetic time series and the possibility to use them in the field of various geodynamical investigations.