



**Doctoral Thesis (set):** Study of the troposphere from GNSS observables, applying it to study climate at a regional level, in the Principality of Asturias. Study of advances in the treatment of tropospheric component of GNSS observables and its application to obtain climate variables.

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**Abstract:** The study and modeling of GNSS observable errors, allow working with valid accuracies in the field of Geodesy. The analysis of error produced in the troposphere is especially an important value to guarantee the required accuracies. Therefore, numerous efforts in obtaining tropospheric and meteorological models and parameters have been carried out, in order to get a more accurately calculation (GPT, GPT2, use of numerical models of time...). On the other hand, the increasingly demanded climate studies have seen in the GNSS observables a new source of information. With the launch of several Galileo and Glonass satellites and the complete GPS constellation (along with the future addition of Beidou) these systems allow progress in the study of the atmosphere from their observable information.

This thesis aims to study the latest developments in tropospheric component and its effect on the calculation of error. The observation equation will be reviewed in detail, especially as it has to do with the tropospheric component. The feasibility of the application of certain new models will be studied, depending on whether scientific or commercial software. Besides, the uses of GNSS observables for climate analysis will be studied.

**Available Means:** GNSS observables from CORS are available, providing GPS and GLONASS observables with open access. Moreover, receivers to collect GPS, GLONASS and Galileo data are available. Regarding the software, commercial software from Leica and Trimble enterprises, as well as scientific software Bernese and Gamit are available.

#### References:

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