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Choice of effiscient Carrier wave combination for GPS surveys

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The establishment of geodetic reference frames which are an essential foundation for all surveys related to geodetic works and land management is not a simple task and expects more attention to avoid an error blemished results.

Large country like Algeria cannot afford a dense, nation-wide control GPS network without minimsation of these errors.
In order to perform this task, we need to establish an observation strategy taking in account all the correction which will be bring to the GPS data treatment.

GPS reference works done in the framework of my master thesis have provided an interesting results for the modeling concept of survey errors.

Carrier phase based GPS measurements was not sufficient, if we have not taken in consideration the different parameters (GDOP, Atmosphere , Elevation mask,..) to control the three dimension positions measurement which required a sub centimeter accuracies that could not be reached without bringing several corrections to the patterned errors.

For those applications requiring sub meter or even centimeter-level accuracy in position the working radius of a field station is limited to less than 1000 km for the long baselines station (Arzew-Constantine baseline) in To overcome this unsatisfactory situation, the spatial and temporal correlations of GPS measurement errors introduced by ionosphere, troposphere, and satellite orbit need to be modelled in a real time multi station solution.

A concept for such a local GPS reference network covering only densely control point and benchmark areas can be concerned by this study because reduction of errors propagation effect where an efficient algorithms such as geodetic lines, Levenberg Marquardt and many others has been developed in order to minimize accuracy loss.

Therefore the effort agreed in order to improve accuracies on networks computations has been reduced drastically.

In the paper, we discuss the carrier receiver wave combination choose in order to conjugate it with different algorithms cited above to establish an accurate GPS reference network that can be operated, for geodetic works and positioning results for control and cadastral surveys.