



Positioning improvement by L1-L2 wave combination implementation in Data process

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Geodetic reference frames are an essential foundation for all surveys related to geodetic works and land management that is why their realization is not an easy task and requires skills and more attention to avoid errors. Large area cannot provide a dense nation-wide control GPS network without minimization of these errors.

In order to perform this task, an observation strategy taking in account all the corrections which will influence the GPS data treatment is necessary.

GPS reference works done in the framework of my master thesis have provided interesting results for the modeling concept of survey errors. Carrier phase based GPS measurements were 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 appropriate radius of a field station is limited to less than 1000 km for the long baselines station (Arzew-Constantine baseline). To overcome this unsatisfactory situation, the spatial and temporal correlations of GPS measurement errors introduced by ionosphere, troposphere, and satellite orbit need to be modeled in a real time multi station solution.

A concept for such a local GPS reference network covering control point and benchmark areas only densely can be concerned by this study because reduction of errors propagation effect where an efficient algorithm 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 this paper, we discuss the carrier receiver wave combination choice in order to conjugate it with different algorithms cited above to perform an accurate GPS reference network that can be operated, for geodetic works and positioning results for control and cadastral surveys.