



Benefits for navigation and atmosphere remote sensing by integrating GPS and GALILEO systems

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The work has the objective to demonstrate as the future GALILEO will improve dramatically the performances of the current Global Navigation Satellite Systems. In particular we analyzed the improvement we could have if GALILEO system will be integrated with GPS and will take care of inter-operability. We expect the most important benefits of their integration and interoperability will occur in the urban areas with high human density. The presence of deep urban canyon, together with a dramatic radio-electric pollution, make indeed, currently unavailable the navigation signals for long time and space. So we have performed a GPS campaign in the city of Naples to underline as the GPS don't succeed in tracking the needed number of satellites to compute the correct receiver position. Then we have performed a simulation just to demonstrate as doubling the number of satellites the number of satellites in view increases and the quality of the navigation data (Dilution of Precision) is improved. The simulation has been performed running a car route through the city and computing the GDOP with: GPS only, GALILEO only and GPS+GALILEO. We have used for such computation a tridimensional numeric cartography of an area of Naples (Italy) particularly charged on the urban point of view.

The atmosphere remote sensing is another field in which promising improvements can be achieved by a join use of the systems. In particular we plan to demonstrate the not negligible benefits the Earth radio occultation techniques will enjoys by using a double constellation of GNSS satellites in terms of number of occurring events. The doubling of the number of occultations will make more feasible the set up of a numerical weather predictions service based on global scale and a more precise and relevant monitoring of Climate Global Change. In particular It will be demonstrated

how the increasing number of GNSS radio occultation events will make more feasible the inter-calibration of different satellite payloads devoted to climate monitoring.