

# Improve the Accuracy of SPP and Reduce the Cost When Using Global Navigation Satellite System

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## SUMMARY

The standard scenarios for GPS surveying can be performed by either of two ways: single point positioning SPP, or differential positioning DGPS. SPP employs one GPS receiver, while DGPS employs two (or more) GPS receivers. The disadvantages of DGPS are: dependency on the measurements or corrections from a reference receiver, the accuracy degradation when the rover receiver is being far from the reference receiver, the cost of two GPS receivers and associated software. On the other hand, SPP mode has become an attractive alternative to the differential GPS mode of positioning. Until now, the instantaneous accuracy of the GPS single point positioning was limited by many errors. This paper tries to improve the accuracy of SPP by selection the best error models in Mecca observations. Precise ephemeris from (IGS), Klobucher ionosphere model, and Hopfield or saastimoinen troposphere model with cut off angle  $220$  and  $GDOP \geq 6$  would give an appreciable improvement for SPP. One way of reducing the cost of GPS surveys is to propose that the reference station receiver be operated as a service by some government agency or private industry organization. In this way the surveyor need only purchase a single GPS receiver. This paper also concluded that multi-references solution with code solution improves the accuracy of single references solution but using of single references with phase-code solution gives nearly the multi-references solution in Mecca , Egypt and Kuwait networks