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To Locate the Area of Suryodaya College of Engineering and Technology by Differential Global Positioning System

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ABSTRACT

Wide area network carrier phase services. These services utilize the dual frequency carrier phase of the GPS signal and have sub-decimetre level position accuracy. The carrier phase measurement accuracy is sub-centimetre, and the phase is far less susceptible to multi-path than the code. Orbit/Clock services. This concept utilizes reference stations with a worldwide spread to calculate the orbit and the clock value of each GPS satellite more accurately than the broadcast GPS ephemeris. Orbit and clock corrections to the broadcast ephemeris are then transmitted to user. These corrections are valid worldwide and the distance from the nearest reference stations to the user does not affect performance. This concept utilizes reference stations with a worldwide spread to calculate the orbit and the clock value of each GPS satellite more accurately than the broadcast GPS ephemeris. Orbit and clock corrections to the broadcast ephemeris are then transmitted to user. These corrections are valid worldwide and the distance from the nearest reference stations to the user does not affect performance. This concept utilizes reference stations with a worldwide spread to calculate the orbit and the clock value of each GPS satellite more accurately than the broadcast GPS ephemeris. Orbit and clock corrections to the broadcast ephemeris are then transmitted to user. These corrections are valid worldwide and the distance from the nearest reference stations to the user does not affect performance.

1. INTRODUCTION

Differential global positioning system (DGPS) is an enhancement to global positioning system that provides improved location accuracy, from the 15-metre nominal GPS accuracy to about 10cm in case of the best implementations. DGPS uses one or several (network) fixed ground based reference stations in known locations. The base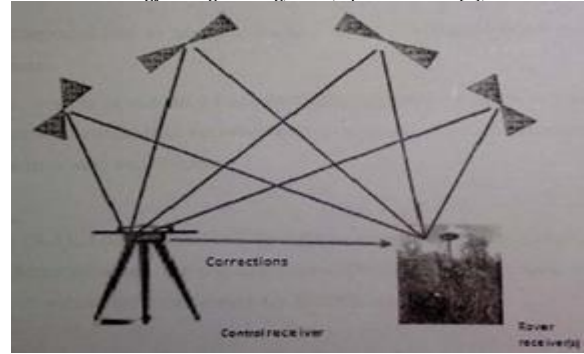 station compares its own known location, to that computed from a GPS receiver. Any difference is then broadcast as a correction to the user.

Differential GPS technology is one in which two GPS receivers are usually used to track a single satellite simultaneously. There is usually the control of reference receiver usually located at a known position. The reference receiver at the known control point measures the errors in the GPS signals and transmits the corrections to the rover receivers. The corrections can be real time

or can be computed later on during post processing.

The DGPS technology is usually capable of improving the accuracy of GPS measurements as it models the ionospheric errors.

Need of DGPS – by using DGPS we can improve our positional accuracy from around 1.5m with standard GPS to around 40cm with DGPS, without the need for post processing RTK- real time kinematic is an advanced form of DGPS which uses the satellites carrier wave to compare 2 observations from different receivers within the system, to fine tune the satellite and receiver clock errors, thus improving positional accuracy. The GPS signal is made up of 3 distinct.

	LADGPS	CDGPS	WADGPS
Method	Code-base	Carrier-base	Code/carrier-base
Accuracy	Meter	Centimeter	Meter
Coverage	~200km	20~30km	~1000km
Reference data	RTCM 1/9	RTCM 18~21 RTCM 3 raw data	Error correction vector
Techniques	DGPS IDGPS	Kinematic (RTK/semi static)	WAAS
Applications	Navigation	Survey	Aviation
Reference type	Single reference		Multi-reference

The classification according to a DGPS system

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1. STUDY AREA

Georeferenced Satellite Imagery Use The imagery of the study area is taken from the Google Earth Pro, then georectified with Control coordinates of DGPS Survey using ArcGIS Software. DATA USED Cartosat-1:DEM-version-1 CARTOSAT1 is the first Indian Remote Sensing Satellite capable of providing in-orbit stereo images.

The data and materials required for the planning and implementation of the research were as follow-
Data- a preliminarily index diagram of base station registration section from the survey of sitamarhi, Bihar.

Equipmreceivers, 2) Handheld GPS receiver 3)Computer 4)Compact disc 5)Tape measure 6)Tripod standent's-1)Single frequency differential GPS

Cartosat-1:DEM-version-1 CARTOSAT1 is the first Indian Remote Sensing Satellite capable of providing in-orbit stereo images. The images were used for Cartographic applications meeting the global requirements. Cameras of this satellite have a resolution of 2.5m (can distinguish a small car).The Cartosat1 provided stereo pairs required for generating Digital Elevation Models, Ortho Image products, and Value added products for various applications of Geographical Information System (GIS).

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2. METHODOLOGY

The data and materials required for the planning and implementation of the research were as follow
Data- a preliminarily index diagram of base station registration section from the survey of Sitamarhi, Bihar. Equipment's-

1)Single frequency differential GPS receivers,
2)Handheld GPS receiver
3)Computer
4)Compact disc
 5)Tape measure
6)Tripod stand

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3. CONCLUSIONS AND FUTURE SCOPE

The application area using DGPS has proven it to be a useful tool for general boundary georeferncing and fixation if the needed precautions are adhered. The DGPS technique employed in the determination of the 3-D coordinates of the parcel corners yielded acceptable results. The handheld results were not accurate enough.
From the analysis carried out, the following results were obtained, a percentage mean difference of - 10.93% and 15.4% in the eastings and northings respectively, for the DGPS and handheld coordinates.
The northings showed a much higher difference compared to the Eastings. The two sets of coordinates did show strong correlation but their position difference proved the difference between them to be significant. From the calculated position difference between positions obtained using the DGPS and those using handheld values as high as 8m were obtained. Among the 13 positions only two positions which were less than 3m which is usually the survey accuracy for the general boundary surveys.

- This DGPS survey will be leveled with the survey of India Benchmarks present in the State.
- Continuous observation recording stations (CORS) will be established in the state of Maharashtra in due course of time for better accurate measurement
- The geo-fencing of the DGPS (Iconic and secondary points) will be done to highlight the survey points for various departments.

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