

Enhancement of Performance of GNSS

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GNSS performance enhancement (1)

- GNSS offer Position, Navigation and Time service
- GNSS performance can be improved with:
 - (a) Compatibility and Interoperability amongst systems
 - (b) Better iono-tropo models worldwide
 - (c) Proper selection of RF modulation schemes
 - (d) Improvement of the GNSS receiver multipath
 - (e) Extension of GNSS for indoor applications
 - (f) Value addition to GNSS through use of terrestrial technology (Internet, Wimax, FM etc.)
 - (g) Improvement in On-board atomic clock stability and
 - (h) Improved Orbit Determination of Navigation satellites

The WG-B addresses mainly items (b), (d), (e) and (f)

GNSS performance enhancement (2)

- Better iono-tropo models
 - (a) India has installed TEC (Total Electron Content) receivers in L1 and L2 frequency bands through out the Indian subcontinent.
 - (b) TEC data is being collected and analysed for the past 5 years.
 - (c) Krigging and Planar models are being developed for Indian equatorial region
 - (d) Interaction with other GNSS systems in the equatorial region such as Brazil is required to develop a worldwide model

GNSS performance enhancement (3)

- Receiver Multipath
 - (a) Receiver multipath performance is better with BOC modulation
 - (b) Alternatives to simple BOC are MBOC or Alt.BOC
 - (c) Choice of Ranging codes improves multipath performance
 - (d) Harmonisation in selection of centre frequencies and codes will help considerably
 - (e) Improving the receiver sensitivity and use of FEC will help in indoor positioning

GNSS performance enhancement (4)

- GNSS and indoor applications
 - (a) Extension of PNT services for indoor applications is essential for many large market applications
 - (b) Use of Internet, WiMAX and terrestrial FM systems needs to be studied
 - (c) Urgent need to pursue area specific R&D in this area.

Way Ahead

- Developing countries can benefit from the availability of a large number of Navigation satellites.
- Regional workshops to educate non-space countries in the use of GNSS for various applications
- Use of area specific technologies
- More frequent interactions in WG-B members



THANK YOU
For Your Attention