

PNT: concept evolution, future trends and applications

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PNT stands for positioning, navigation, and timing. Space-based PNT refers to the capabilities enabled by GNSS as well as Ground and Space-based Augmentation Systems (GBAS and SBAS) which provide position, velocity, and timing information to an unlimited number of users around the world, allowing every user to operate in the same reference system and timing standard. Such information has become increasingly critical to the security, safety, prosperity, and overall quality of life of citizens around the world. As a result, space-based PNT is now widely recognized as an essential element of the global information infrastructure. This paper discusses the importance of the availability and continuity of PNT information, whose application scope and significance have exploded in the past 10-15 years. A paradigm shift in the navigation solution has been observed in the past years. It has been manifested by an evolution from a single sensor-based solution, to a multiple sensor-based solution, to collaborative navigation and layered sensing, using unconventional sensors and techniques.