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THE ESTABLISHMENT OF THE FIRST GLOBAL NAVIGATION SATELLITE SYSTEMS (GNSS) RESEARCH LAB

Abstract

This research contribution outlines the establishment and contributions of First GNSS lab in Pakistan along with the history of specialized MS GNSS Program since 2014. The Global Navigation Satellite Systems (GNSS) Research Lab, a component of National Center of GIS and Space Applications (NCGSA), a project of Higher Education Commission (HEC) of Pakistan, is a state-of-the-art research facility at Institute of Space Technology, Islamabad, is equipped with cutting-edge GNSS receivers and equipment. The lab is committed to advancing the field of GNSS through rigorous research in various domains, including constellation design, NAV- COM integration, GNSS Signal integrity monitoring , space weather, natural hazard monitoring, earthquake monitoring, ionosphere monitoring, and volcanic eruption monitoring. One of the key achievements of the GNSS Lab has been the development of a regional navigation satellite system for Pakistan, which has the potential to revolutionize navigation and positioning services in the country. The lab has also made significant contributions to the study of natural hazards and geological events using GNSS signals, which can help to improve disaster response and management efforts. In addition, the GNSS Lab has developed software GNSS receivers for various applications, as well as advanced algorithms for signal security and interference detection and mitigation. These developments have the potential to improve the accuracy, reliability, and security of GNSS services in various sectors, including transportation, telecommunications, and emergency response. Moreover, the GNSS Lab is actively engaged in education and outreach activities, including seminars, workshops, and training sessions, to promote the use of GNSS technology and provide valuable insights to professionals, researchers, and students. By fostering collaborations and promoting innovation in this field, the GNSS Lab is playing a crucial role in advancing the state-of-the-art in GNSS technology and its applications. In conclusion, the GNSS Research Lab in NCGSA is a phenomenal research and teaching facility dedicated to advancing the field of GNSS through rigorous research, innovation, and education.