Report on GNSS Training

Course ID: T151-40

Team No: 07

Team Members:

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Sunil Bogati

Training held at GIC/AIT, Thailand

6 – 10 JAN 2020

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1.1. EXECUTIVE SUMMARY

Global Navigation Satellite System (GNSS) is composed of number of satellite constellation system developed by various countries like USA (GPS), Russia(GLONASS), Europe (Galileo), China (BeiDou), Japan(QZSS) and India(NAVIC). Further, other countries have proposed to launch their own system. One of the major applications of GNSS is to act as the reference for accurate and precise position calculation which is satellite navigation or satnav system. It is a system that uses satellites to provide autonomous geo-spatial positioning.

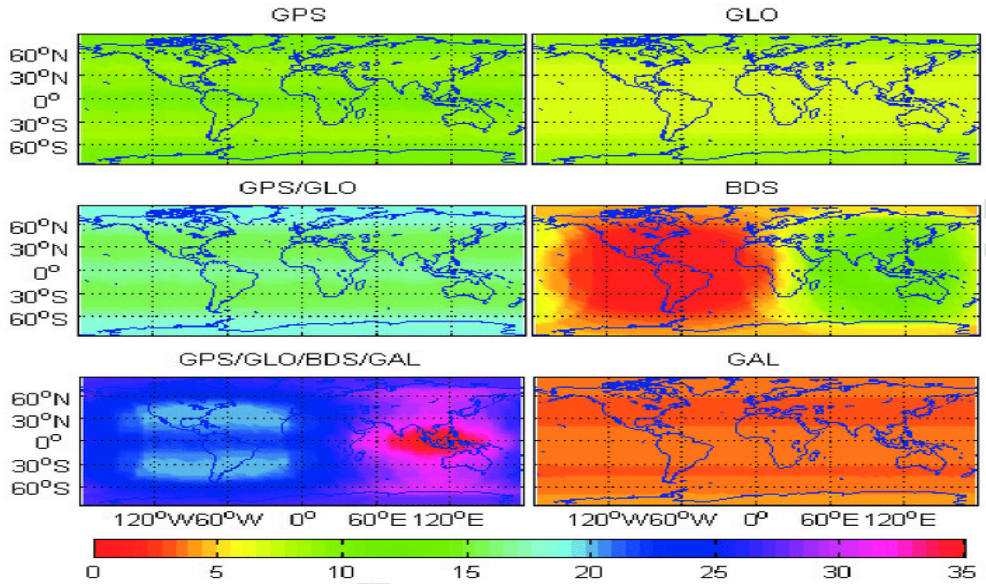

Figure 1: Global and regional distribution of satellite

Although, maximum number of satellite are visible in Asia-ocean region due to presence of regional satellite constellation like BeiDou, Navic and QZSS apart from other regional satellite system, limitation in education, training and awareness is limiting GNSS application. Thus, we appreciate training on GNSS conducted on 6-10 Jan 2020 co-organized by GIC/AIT, CSIS/UT and ICG and glad to attain and get benefitted with it. During a week-long training program, we learn to acquire, analyze and visualize high precise and accurate geospatial data with low cost GNSS receiver. We also learn to do critical analysis and get to aware about requirement for more accurate and precise data. Further, data collection, analysis and visualization with various methodologies such as single, DGPS, Kinematic, Static, RTK and PPP were practiced.

1.2. TEAM MEMBERS

GNSS Training, Team No: 07		
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Figure 2: Team 07 busy with static geospatial data collection (From left: Krittanut, Nichalak, Sunil and Pravakar)

1.3. INTRODUCTION

Series of lectures and practical session followed, guide our team to be aware with GNSS system, its history, application, undergoing projects and future prospects. Although, our team comprised with survey engineers with basic knowledge and usage background, the training session made us know about how GNSS system work, how economic accuracy can be obtained and exploited for greater benefits. Week long training was concluded making us aware and confidence in following:

i. GNSS: Introduction, Working procedure, Application, Knowledge sharing and Platform

ii. GNSS receiver: Base and Rover, Low cost receiver: Ublox EVK M8T and F9s

iii. Computer and Mobile Application: Ublox Ucenter, RTKLib, RtkDroid and SW Maps

Figure 1: Ublox EVK M8T Hardware requirements and Connectivity

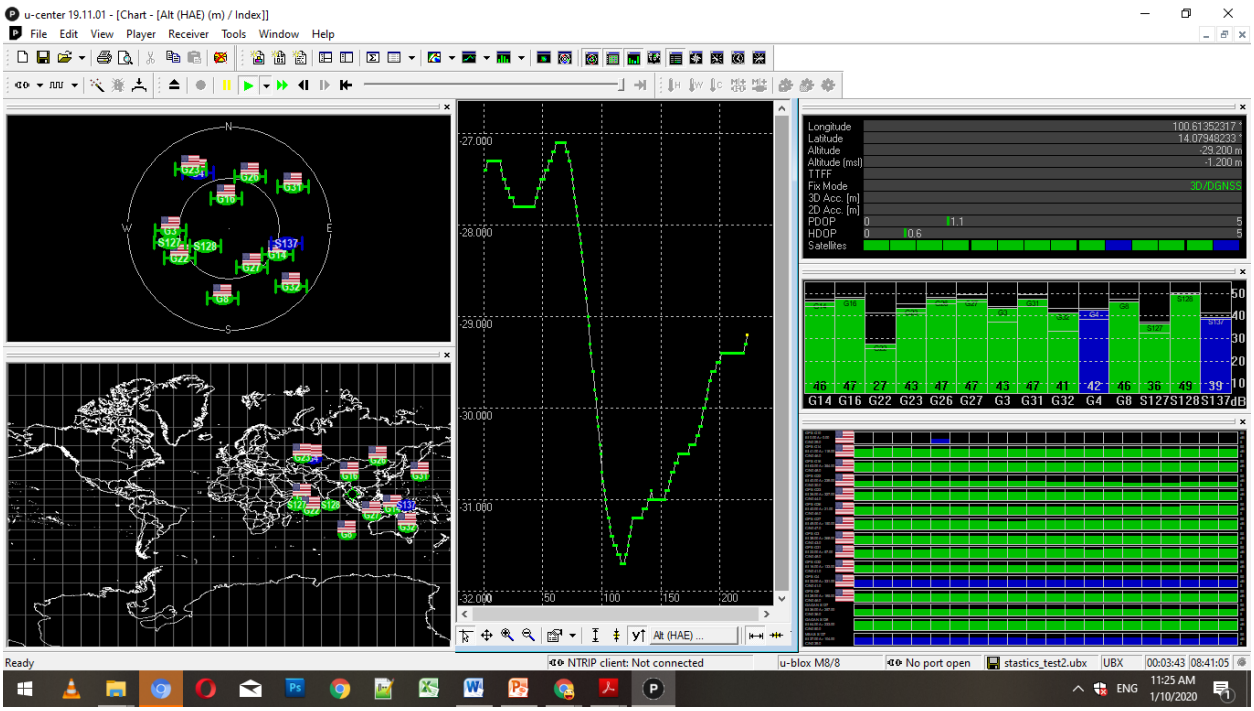


Figure 3: U-center User Interface interface (window version)

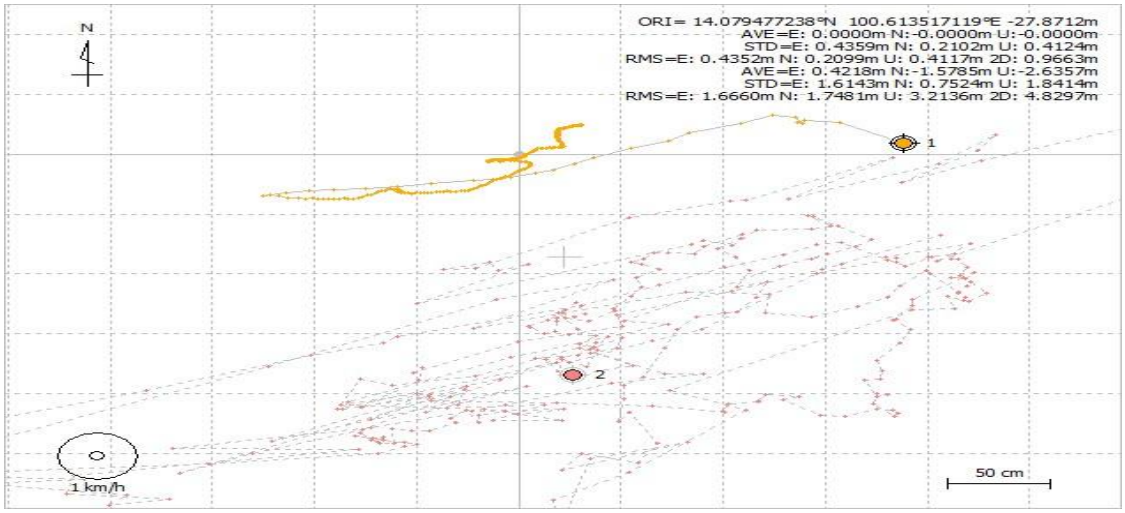


Figure 4: Single (2) Vs. Kinematic (1) positioning mode for static object

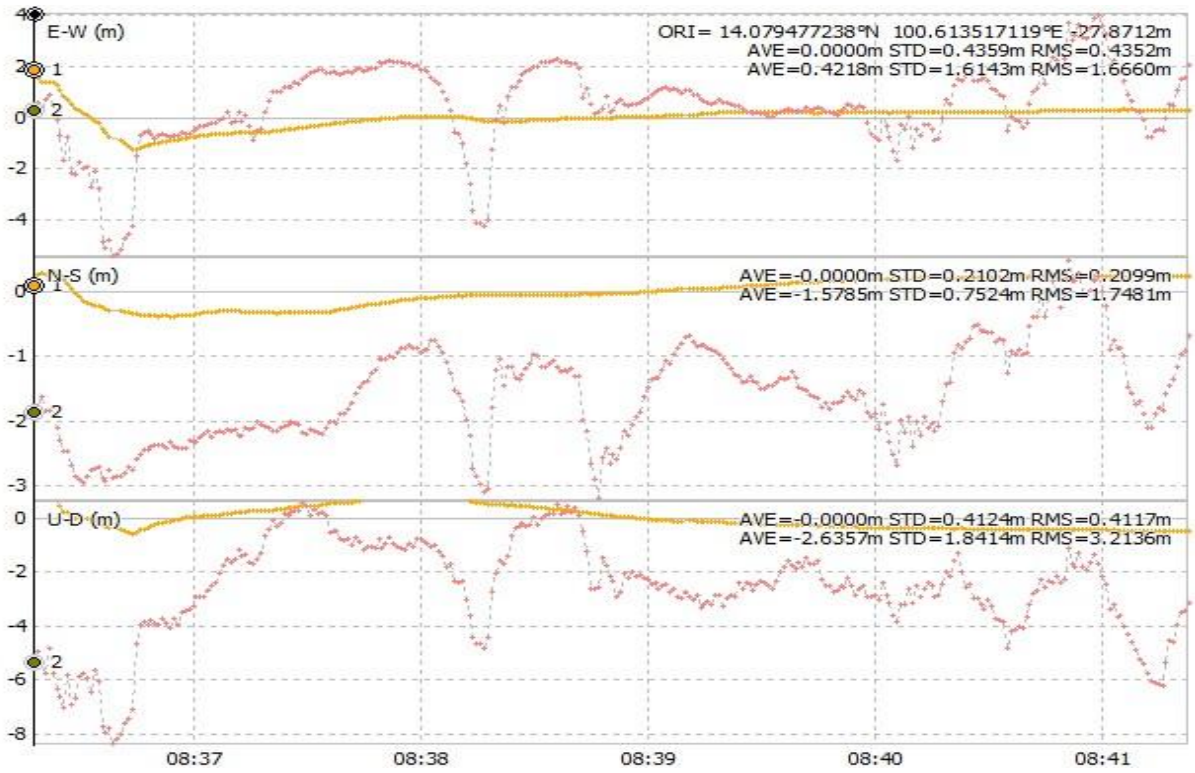


Figure 5: Single Vs. Kinematic Positioning mode position comparison

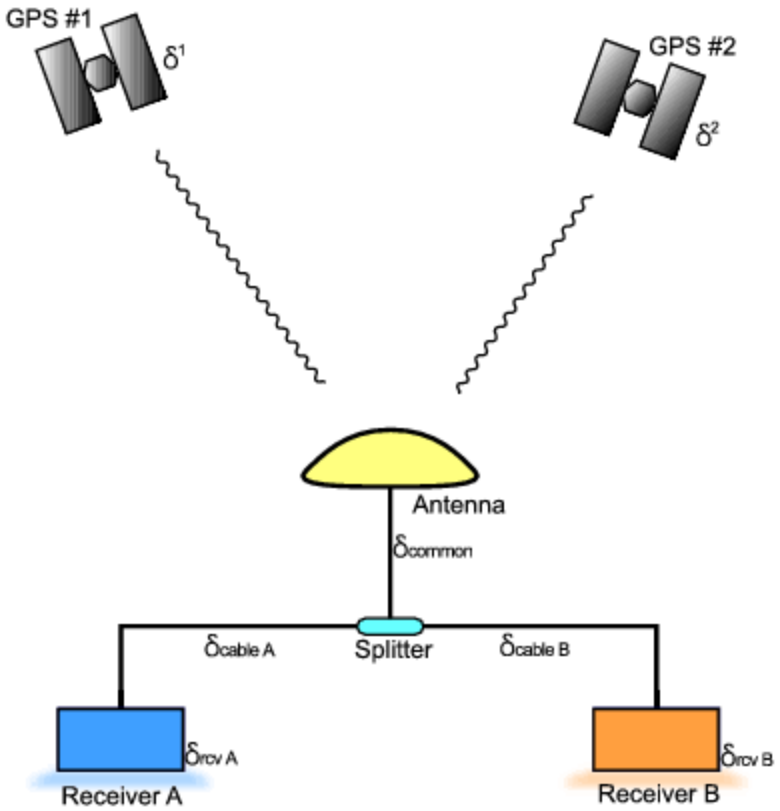


Figure 6: Zero base line setup

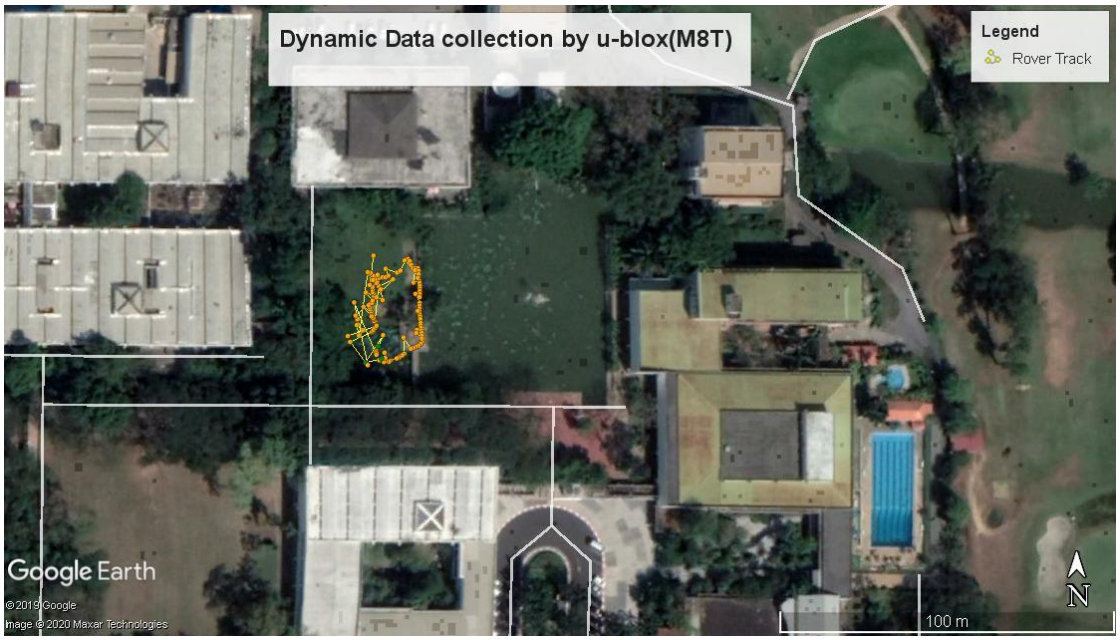


Figure 7: Dynamic geospatial data collection

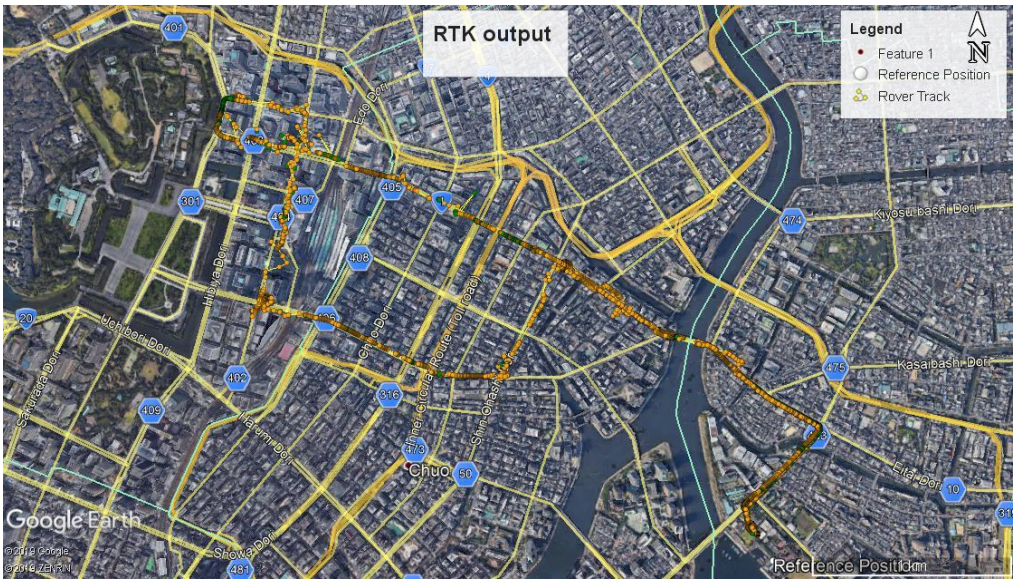
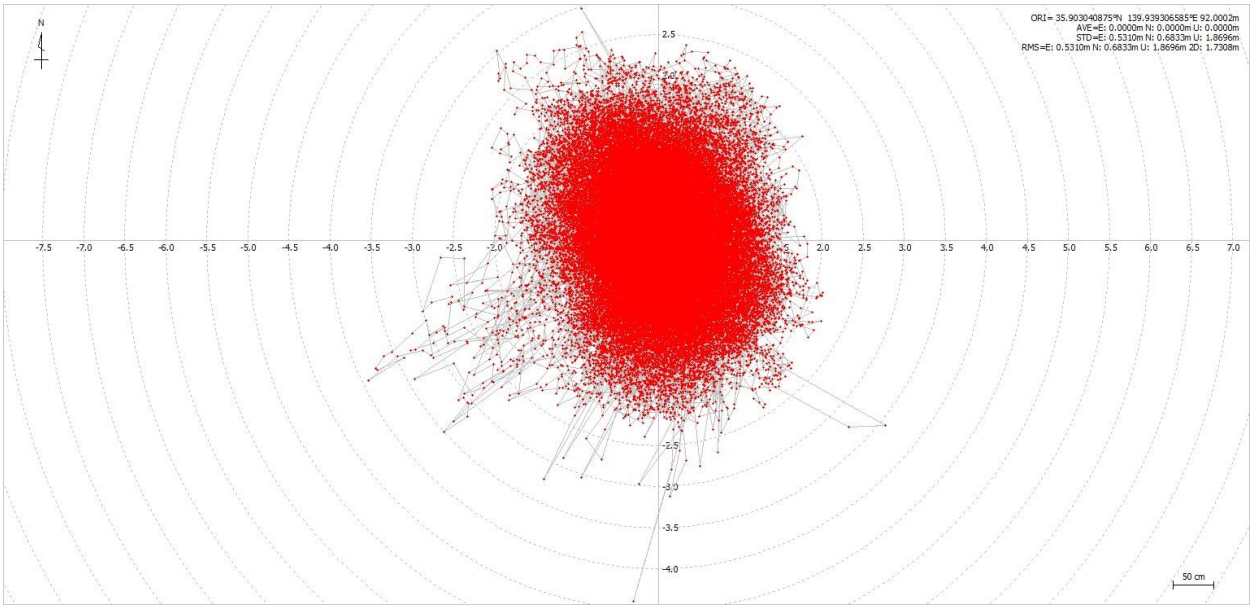


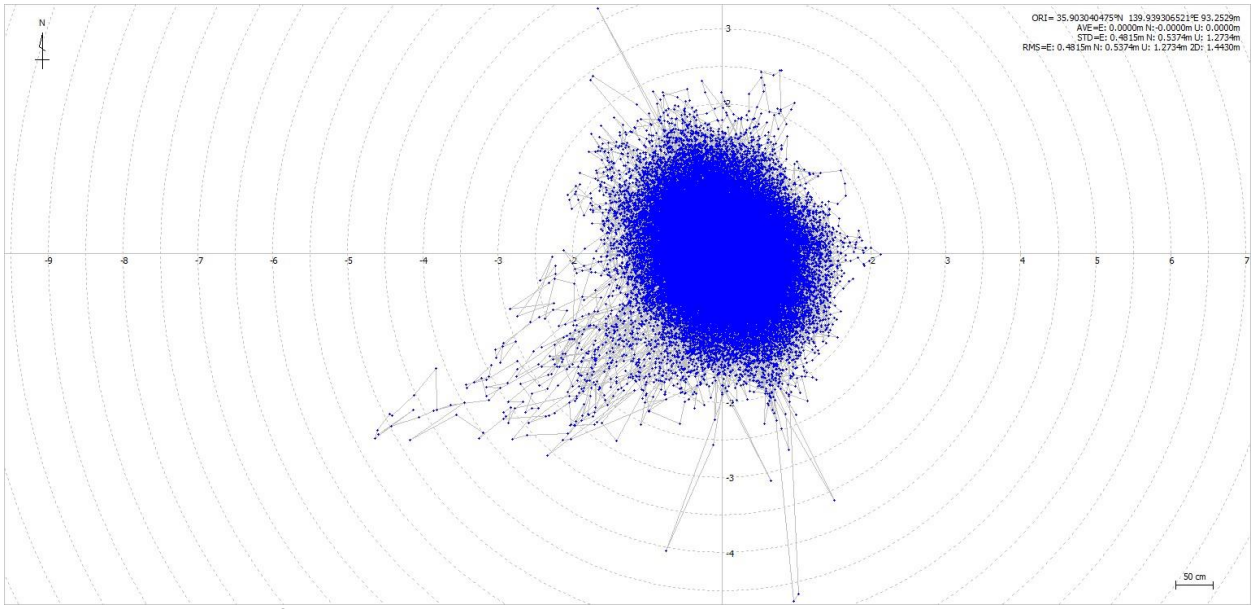
Figure 8: Data analysis and visualization of RTK geospatial data collection

1.4. SUMMARY

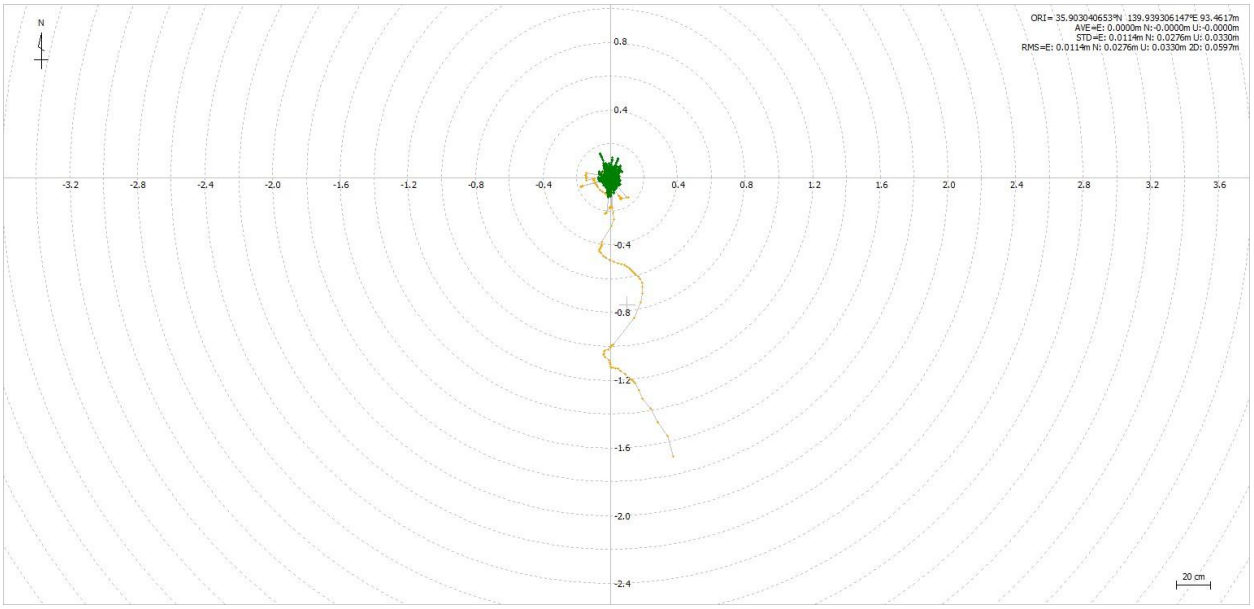
1. Zero Baseline for Static Data using RTKLib : SPP



2. **Zero Baseline for Static Data using RTKLib : DGNSS**



3. Zero Baseline for Static Data using RTKLib : Kinematic



1.5 CONCLUSION AND RECOMMENDATION

The GNSS Training give a clear explanation of satellite constellations used for navigation, signal structures, system errors and a full explanation of the different types of augmentation that can be applied.

we fulfilled by understand about how a GNSS receiver works, its signal structures as well as its applications including survey methods for obtaining higher accuracies and have an in-depth understanding of GNSS, its principles and benefits for civil aviation.