

CN445 GNSS Antennas II – Special Topics
September 22, 2009, 1:30 pm-5:00 pm, CEU: 3.0
GNSS Solutions® Tutorials prior to ION GNSS 2009, September 21-22, 2009
Marriott Savannah Riverfront, Savannah, GA

Instructor: Dr. Rama Rao, Mitre Corporation

Prerequisite: Knowledge of mathematics, antennas, electromagnetics and GNSS will be useful. Additionally, knowledge from a GNSS antennas course (i.e., CN441 GNSS Antenna I) will be useful. (Knowledge of vector calculus and Maxwell's Equations is not required.)

Intended Audience: Engineers, scientists and managers interested in the design, development, implementation, and/or use of GNSS antenna for GPS, Galileo, Glonass and/or other satellite navigation systems. The course provides an introduction to advances in antenna technology needed for meeting new and emerging GNSS applications. This course is a sequel to CN441 GNSS Antennas I.

Notes Provided: Slides presented will be professionally spiral bound, with clear plastic cover, including color to add clarity where needed.

Reference List: A reference list will be provided as part of the note package for completeness and to allow the interested attendee to obtain additional information.

Course Overview: This course present information on special and advanced topics related to GNSS for particular applications, which are important to many users. Antenna measurement effects and specialized antennas to maximize GNSS performance will be presented.

Course Content: The main topics to be covered by this course are:

Multiband GNSS Antennas For Modernized GPS, Galileo & Glonass :

- Conical Spiral, Archimedean Spiral, Spiral Mode Microstrip, Helical Antennas
- Pin Wheel Spiral Antenna (Novatel), Zephyr Geodetic Antenna (Trimble)
- Multiband Stacked Microstrip, Bow Tie Antennas on Corrugated Ground Plane

Antennas for Assisted GPS

- Compact Quadrifilar Antenna(Sarantel)&Ceramic Patch Antenna for Hand-sets
- Planar Inverted F Antennas (PIFA) for GPS Bluetooth, Wireless; Textile Antennas
- Human Body Interaction with Hand-Set Antennas via measurements on Phantoms

Adaptive Antenna Arrays:

- Multiple Element Antenna Arrays for Reducing Interference and Jamming,
- Introduction to Power Inversion, Space Time (& Space Frequency) Adaptive Processing
- Polarimetric Adaptive Array ; Beam Forming & Nulling Antenna Arrays

Active GPS Antennas:

- Measurement metrics and G/T Ratio

Ground Plane & Fuselage Effects

- Mitigating Methods (rolled edge, photonic band gap, resistivity taper, corrugations)
- Aircraft Fuselage Effects Investigations Using Scale Models and simulation

Antenna Effects on GNSS Observables:

- Phase Center Variation (PCV), Phase Wrap-up in Spinning Missiles
- Group Delay and Antenna Bandwidth Effects on M code for Modernized GPS
- Measurement Techniques for PCV & Group Delay

Course Outcomes: At the completion of this course, the attendee should have a better understand of special and advanced considerations for GNSS antennas in particular applications to enable enhanced performance.