

ICTP DIPLOMA PROGRAMME IN EARTH SYSTEM PHYSICS 2015-16

SYLLABUS

SPACE GEODESY AND InSAR_ - {12 Lectures = 18 hours} A. Borghi

1. Fundamentals of Geodesy
 - Definition of the Earth gravity field.
 - Reference surfaces: geoid and ellipsoid.
2. Fundamentals of Space Geodesy
 - Definition of Space Geodesy
 - Definition of global and local coordinate systems
 - Description of the satellite motions
 - Forces acting on the satellites
3. GPS observables
 - Pseudo ranges
 - Carrier phases
 - RINEX format
4. Errors in the GPS observables
 - ionosphere
 - troposphere
 - multipath
 - phase center variation
5. Mathematical model of GPS observables
 - relative and absolute positioning
 - linear combination of observables
6. Methods of processing GPS data
 - Commercial software
 - Scientific software
7. GPS Time series analysis
 - Deterministic model
 - Stochastic model

8. Kinematic applications

- DGPS
- NRTK

9. SAR

- Definition of RADAR
- Definition of SAR
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10. Interferometry

- Definition of InSAR
- phase unwrapping
- applications

11. DinSAR

- Definition of DinSAR
- applications

12. GPS and InSAR geophysical applications

- case studies