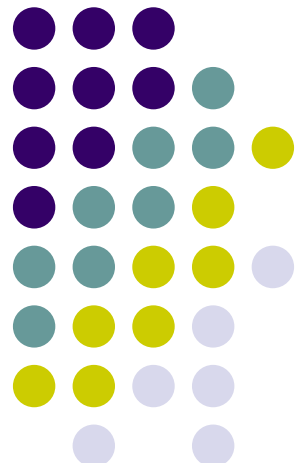
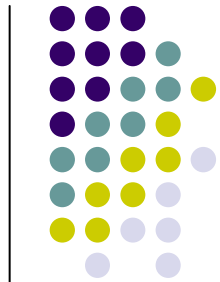
High Precision GPS Geodesy

Instructor: D Uğur Şanlı



Introduction

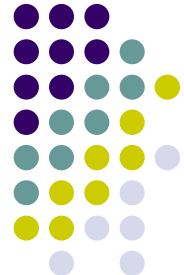


- Advances in GPS Technology
- Improvement in GPS receivers
- GPS signal structure
- Denial of Accuracy
- Precise orbit determination
- Modeling and estimating the troposphere
- Ambiguity resolution
- Eliminating clock errors
- Geodetic Accuracy and Precision

Introduction

- GPS Software development
- The Role of the IGS
- Emphasis on Vertical Component

The Concept of High Precision

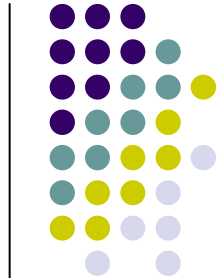


- Hardware and software
- International Standards
  - Precise orbits
  - Foundation of the IGS
  - The structure of the IGS
  - IGS Products
- Experiment design and strategies
- A note on GPS users

Geodesy and Tectonics

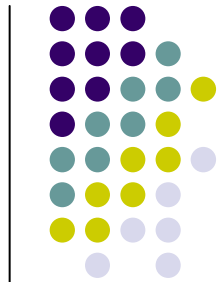
- Contribution of GPS to Geophysics
- Comparisons to EDM and VLBI
- Deformation related to Earthquakes
- Role of GPS among the other space techniques
- GPS Accuracies over Local and Global Scales

Monitoring Horizontal Motion



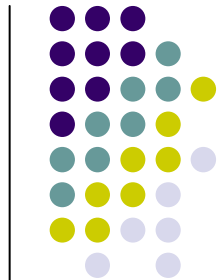
- Global tectonics and space geodesy
- Plate motion
- Plate boundaries
- Plate Tectonic Data
- Contribution of Space Geodesy into Tectonics
- Advantage of Space techniques

Monitoring Horizontal Motion



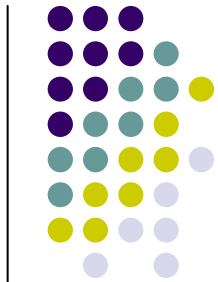
- Global plate tectonics
- Tectonics of Turkey
  - GPS field works
  - Data analysis
  - Horizontal velocity field
  - Kinematics of the deformation
- Monitoring earthquakes using continuous GPS

Monitoring Vertical Motion



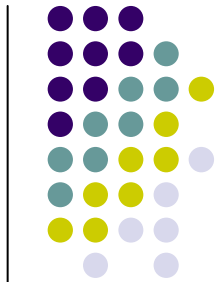
- Definition of height problem
  - Effect of satellite-receiver geometry
  - Atmospheric effects
  - Modeling tropospheric zenith delay
  - Inferences for relative positioning
- GPS Derived Orthometric Heights
  - Relation of geoid and ellipsoid
  - Determining geoidal heights
  - Accuracy
  - Case studies

Monitoring Vertical Motion



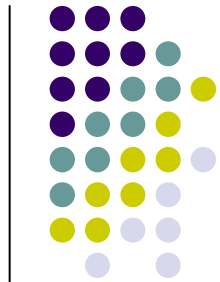
- Loading effects
  - Ocean loading
  - Atmospheric loading
  - Hydrological Cycle
- Effect of weather fronts

Monitoring Sea Level Using GPS



- The cause of sea level rise
- Impacts of sea level rise
- Measures taken by the World community
- GPS strategies for better monitoring

Research Software



- Introduction
- General features of research software
- Comparison with commercial software
- Typical results using 24-hour data
- Commonly used research software
- Introduction to GIPSY
- GIPSY Modules
- GIPSY Precise Point Positioning

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