

COORDINATE SYSTEMS - GED 505

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General Overview

Definitions:

Geopotential Surface, Spheropotential Surface, Geop, Sherop and Deflection:

Deflections

- Deflection According to Helmert
 - Deflection According to Pizetti
 - Deflection According to Molodenski
 - Astrogeodetic deflection
 - Absolute deflection
 - Gravimetric deflection
 - Topographic-Isostatic deflection
 - Topographic deflection
 - Isostatic deflection
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Earth Fixed Coordinate Systems

- Natural (Astronomical) Coordinate System
- Model (Elipsoidal) Coordinate System

Natural (Astronomical) Reference Coordinate Systems

Global Natural (Astronomical) Rectangular Coordinate System (X,Y,Z)

Global Natural (Astronomical) Curvilinear Coordinate System (Λ, Φ, W),
(Λ, Φ, H^*)

Local Natural (Astronomical) Rectangular Coordinate System (e^*, m^*, n^*)

Local Natural (Astronomical) Curvilinear Coordinate System (α^*, β^*, l^*)

will be explained by figures.

Model (Elipsoidal) Reference Coordinate Systems

Global Model (Elipsoidal) Rectangular Coordinate System (u,v,w)

Global Model (Elipsoidal) Curvilinear Coordinate System (λ, ϕ, U), (λ, ϕ, H),
(λ, ϕ, h)

Local Model (Elipsoidal) Rectangular Coordinate System (e,m,n)

Local Model (Elipsoidal) Curvilinear Coordinate System (α, β, l)

will be explained by figures

Differential Relations Between Coordinate Systems

Differential Relations Between Natural (Astronomical) Systems

- Relation with (X,Y,Z) and (e^*,m^*,n^*)
- Relation with (α^*,β^*,l^*) and (e^*,m^*,n^*)
- Relation with (Λ,Φ,W) and (e^*,m^*,n^*)
- Relation with (α^*,β^*,l^*) and (X,Y,Z)
- Relation with (α^*,β^*,l^*) and (Λ,Φ,W)
- Relation with (Λ,Φ,W) and (X,Y,Z)

Differential Relations Between Model (Elipsoidal) Systems

- Relation with (u,v,w) and (e,m,n)
- Relation with (α,β,l) and (e,m,n)
- Relation with (λ,ϕ,U) and (e,m,n)
- Relation with (λ,ϕ,U) and (u,v,w)
- Relation with (α,β,l) and (λ,ϕ,U)
- Relation with (λ,ϕ,U) and (u,v,w)

Differential Relations Between Natural and Model Systems

- Relation with (X,Y,Z) and (u,v,w)
 - Relation with (e^*,m^*,n^*) and (e,m,n)
 - Relation with (Λ,Φ,W) and (λ,ϕ,U)
 - Relation with Ω and D matrices
 - Relation with Ω and E matrices
 - Relation with D and E matrices
 - Relation with Π and E matrices
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WGS 84 Coordinate System and Local System ED-50

ITRF Coordinate System

Turkish Triangulation System – TUTGA

References

Differential Relations between Earth fixed Coordinate Systems, Onur Gürkan.

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Jeodezik Astronominin Temel Bilgileri, Ahmet Aksoy.

Coordinate Systems Lecture notes, Ersoy Arslan.

Fiziksel Jeoezi Ders Notları, Rasim Deniz.