ASE 389P.4 Methods of Orbit Determination
Homework 4: Reference Frames Transformations

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The transformation between an Earth Centered Earth Fixed Earth frame and an Earth Centered Inertial frame is investigated.

Problem

IAU-76/FK5 reduction of position from ECEF (ITRF) to ECI (ICRF)

NOTE: This method uses the IAU-1976 Precession Model & IAU-1980 Theory of Nutation.

Satellite - Galaxy 15

Radius X Y Z ECEF (ITRF) [in kilometers] -28738.3218400000 -30844.0723200000 -6.71800000000000

Gregorian Date (UTC) Year: 2017 Month: December Day: 1 Hour: 0 Minute: 0 Seconds: 48.0003833770752

Julian Date (UTC) 2458088.50055556

Solution

Appendix

HW4 MATLAB code

```
% ASE 389 Orbit Determination
% HW 4
% Junette Hsin
```

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References

[1] Bob Schutz, G. H. B., Byron Tapley, *Statistical Orbit Determination*, Academic Press, 2004.

[2] Jah, M. K., "ASE 389P.4 Methods of Orbit Determination Module 3," , January 2021.