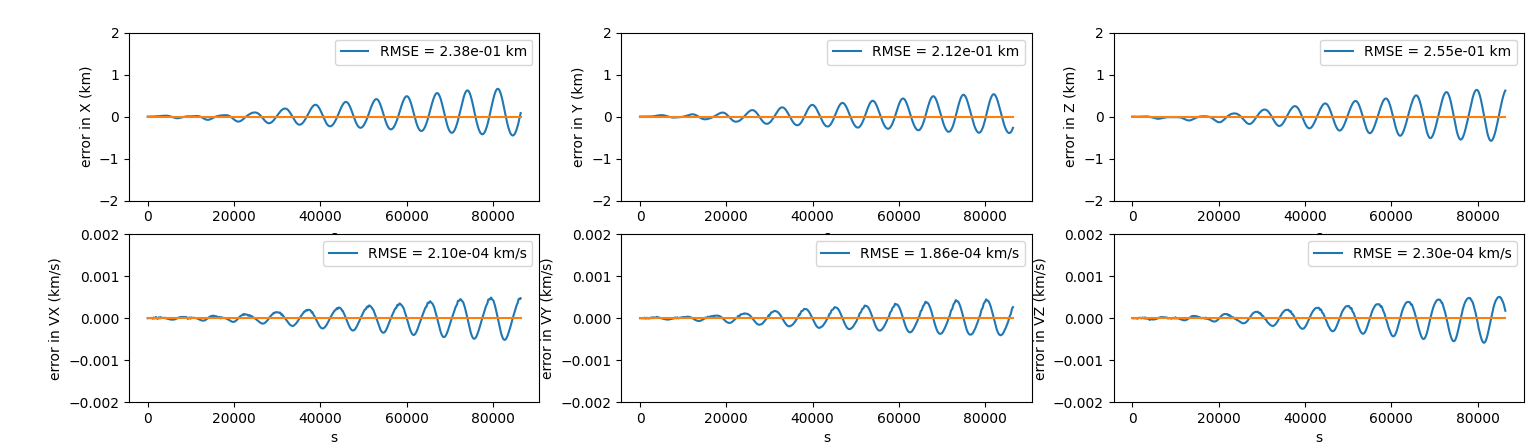
**Report Work**

**Study 5: Improvement of the Lun Geop 🡪 GRAIL 2021**

Reference) 1day, 30s, Old (70\*70): CT = 3.53s



ReferenceMax) 1day, 30s, Old (165\*165): CT = 11.67s

A graph of a graph

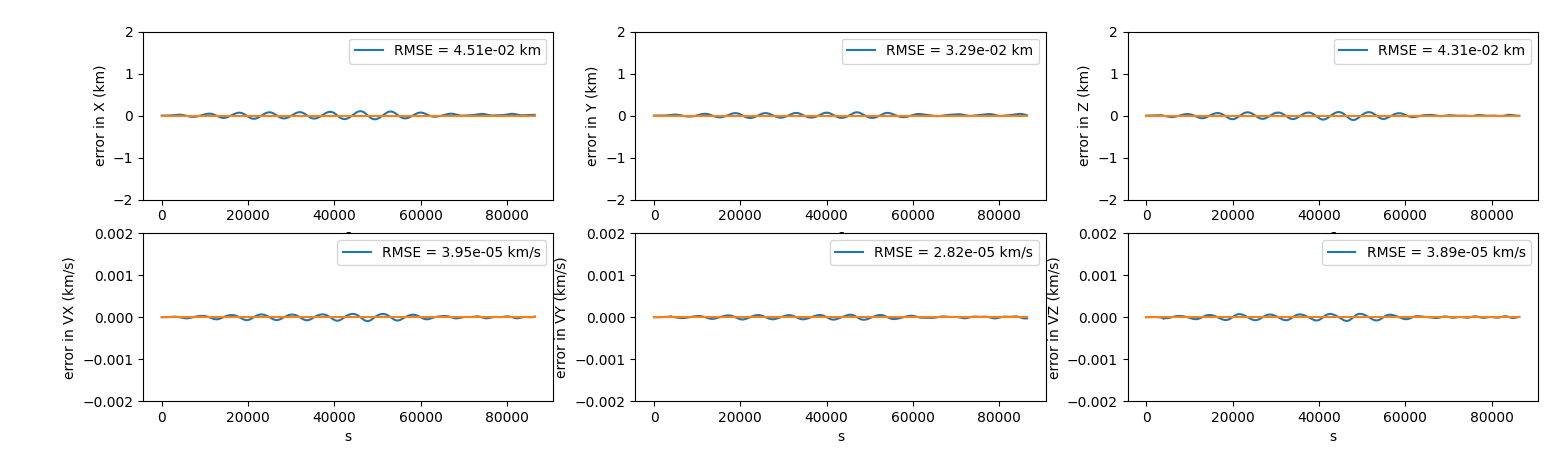
Description automatically generated with medium confidence

Exp1) 1day, 30s, New (70\*70): CT = 4.19s

**A graph of a graph

Description automatically generated with medium confidence**

Exp2) 1day, 30s, New (350\*350): CT = 37.6s



A graph with a line

Description automatically generated

CCL There’s a real improvement of the GRAIL geopotential model 🡪 Keep

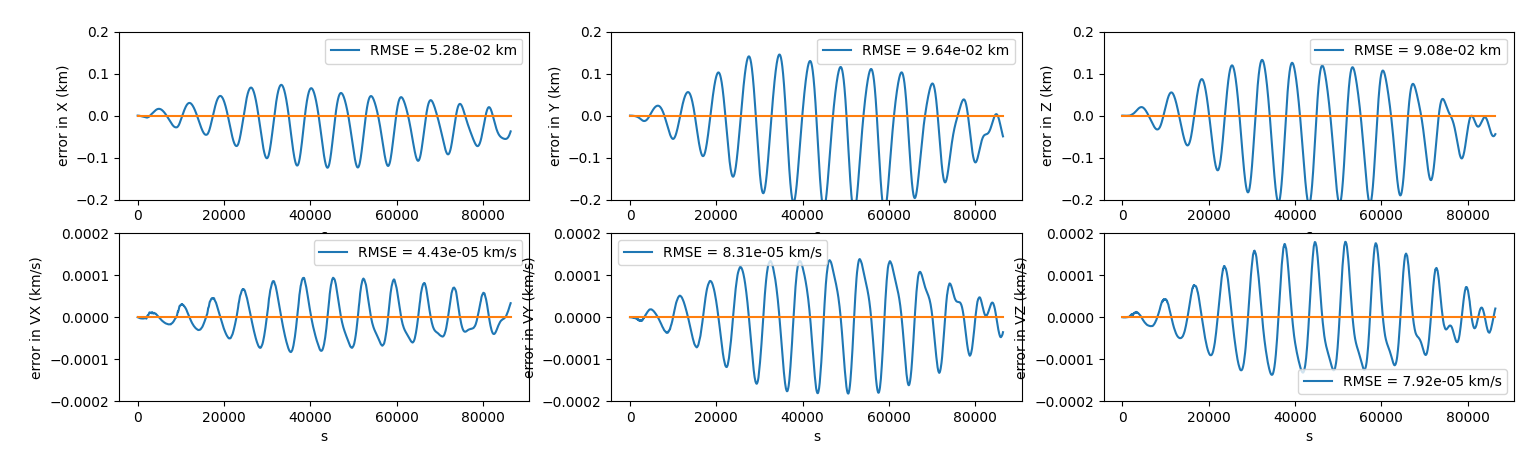
**Study 6: Implementation of Earth Gravit Field**

Prior Implementation 3.8s

A screenshot of a graph

Description automatically generated

Post Implementation, n=0 : 3.1s

****

Post Implementation, n=100 : 6s

A screenshot of a graph

Description automatically generated

A number and numbers on a white background

Description automatically generatedA white background with black numbers

Description automatically generatedA number and numbers on a white background

Description automatically generatedAnalysis (InitPos):

Before: Sun PointM: -aS/M aS/SK aSPert

A number with numbers on it

Description automatically generated with medium confidenceA number with numbers on it

Description automatically generated with medium confidenceA screenshot of a computer

Description automatically generated

Earth PointM: -aE/M aE/SK aEPert

A number with numbers on it

Description automatically generated with medium confidenceA number and numbers on a white background

Description automatically generatedA screenshot of a computer

Description automatically generated

After Earth Harm(3): -aE/M (PM) aE/SK aEHPert

Before all improvement on the propag  
A graph of a graph of a graph of a graph of a graph of a graph of a graph of a graph of a graph of a graph of a graph of a graph of a graph of

Description automatically generated

New Reference: 3.7s  
A graph of a number of hours and a number of hours

Description automatically generated

A graph of a number of hours

Description automatically generated with medium confidence**Study 7: Study on higher order propagator**

A graph with a line

Description automatically generatedOde78: 4.3s

A graph with numbers and lines

Description automatically generatedA graph of a line

Description automatically generated with medium confidenceOde89: 8.1s

RKN12: changing relTol doesn’t change anything: 10\*\*(-6,7,8)

ShampineGordon: last point 514m

Ode87: h9 with step size control

A graph of a line and a line of a graph

Description automatically generated with medium confidenceA graph showing a graph

Description automatically generated with medium confidence

A graph with a line

Description automatically generated

**Study 6: Study on Earth gravity field (continuation)**

Acceleration due to earth: 1.8465e-08

Difference previous/new: 1.6230e-14

Is it important? With and without Albedo at less than 2e16

A graph of a number of hours

Description automatically generated with medium confidenceA graph of a number of hours

Description automatically generated with medium confidence

With new earth pot:

A graph of a line and a line

Description automatically generated with medium confidence

First Part improvement (Norm avec difference): 9.6120e-13

Second Part improvement (Norm avec difference): 9.7514e-13

Float issue? Propagator issue?

**Study 7: Study on GRC**

A 1/r factor is missing. But doesn’t improve too much

A graph of a number of hours

Description automatically generated with medium confidence

If one considers circular orbits:

A graph of a number of hours and a number of hours

Description automatically generated