LATEST DEVELOPMENTS IN LUNAR GRAVITY FIELD RECOVERY WITHIN THE PROJECT GRAZIL

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FORCE MODEL AND PARAMETRIZATION

<table>
<thead>
<tr>
<th>Arc-length</th>
<th>Force modeling</th>
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<tbody>
<tr>
<td>OD: 1.25 days</td>
<td>3rd body accelerations</td>
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<td>GFR: 70 minutes</td>
<td>Solid Moon tides</td>
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<td>Satellite design</td>
<td>Relativistic accelerations</td>
</tr>
<tr>
<td>28-plate macro model</td>
<td>Solar radiation pressure</td>
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<tr>
<td>Empirical parameters</td>
<td>Albedo</td>
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<tr>
<td>4x / rev. (along, cross)</td>
<td>Emissivity</td>
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</tbody>
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NON CONSERVATIVE FORCE MODEL

- Satellite plate macro model [2]
- Modeled accelerations acting on GRAIL-A between low and high solar angle phase

RESULTS AND MODEL EVALUATION

- External solutions
  - JPL lunar gravity field model (GL660B)
  - NASA-GSFC lunar gravity field model (GRGM660PRIM)
  - AIUB lunar gravity field model (AIUB-GRL200b)
- Validation types
  - Free-air gravity anomalies
  - Degree variances

To avoid spectral aliasing, short wavelength signals are reduced from the KBR data using the GL660B lunar gravity model

Lunar gravity field recovery is a huge computational challenge
High performance computer clustering at the IWF
- 32 independent computer nodes (40 cores each)
- 128 GB RAM per node (4 TB in total)

REFERENCES