Session Summary 6
The Role of SLR in Gravitational Earth Modeling

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List of Presentations

1. SLR Applications for Gravity Field Determination (J. Ries/Univ. of Texas)
2. Mass Transport and Dynamics in the Earth System (R. Gross/ JPL)
3. Geocenter Motion Driven by Large-Scale Mass Redistribution (K. Matsuo/Kyoto Univ, T. Otsubo/Hitotsubashi Univ.)
4. The Use of Numerical Weather Models for SLR Data Analysis (L. Petrov/ADNET Systems Inc)
5. The Study on the Coefficients of the Earth's Gravity Using Scaled Sensitivity Matrix Method (W. Qu/SAO, CAS)
6. Assessing Orbit Quality Using SLR (R. Govind/Univ. of Cape Town)

Topics on this field What's new? What's necessary to share.

- In spite of more and better data, as well as new models, best estimate of GM has not significantly changed.
- Long time series of low-degree terms from SLR help put observations from GRACE into context of long-term changes
- From analysis of long-term trend in pole path, decadal polar motion, and decadal polar motion variations, the solid earth model is not only improved, but also found inconsistency in model.
- The relations between geocenter motion and mass loss in polar ice sheet are simulated, and understood quantitatively.
- Atmospheric model is dynamically changing now. For example, Global 4D model of atmosphere and ocean is presented. International mass loading service launched in 2014.
- To combine SLR data into DORIS and GNSS, we can assess orbit qualities.

Summary

- While the GRACE mission is providing an unprecedented insight into the time variations in Earth's gravity field, the determination of the longest wavelength gravity field components from SLR is still an important component.
- From analysis of long-term polar motion, and decadal polar motion variations, solid earth model is improved. But some difficulties of model are recognized.
- By simulating geocenter motion based on solid earth model, we can understood geocenter motion and role of SLR quantitatively.
- China has developed scaled sensitivity matrix method. Their results are useful for independent verification.
- New atmospheric model is proposed. Moreover, international mass loading service launched in 2014.