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## **Abstract Details**

<u>AOGS 1st Annual Meeting</u> > <u>Interdisciplinary Working Groups</u> > Time-Variable Gravity: The Low-Degree Components and Their Connections with Geophysical/Climatic Changes (IWG3D) >

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**Title:** Time-Variable Gravity: The Low-Degree Components and Their Connections with Geophysical/Climatic Changes (IWG3D)

Abstract:

The oblateness of the Earth s gravity field, J2, has long been observed to undergo a slight decrease due to post-glacial rebound of the mantle. Sometime around 1998 this trend reversed quite suddenly. This reversal persisted until 2001, at which point the atmosphere-corrected time series appears to have reversed yet again towards onormalo. This anomaly signifies a large interannual change in global mass distribution. A number of possible causes have been considered, with oceanic mass redistribution as the leading candidate although other effects, such as glacial melting and core effects may be contributing. In fact, a strong correlation has been found between the J2 variability and the Pacific decadal oscillation. It is relatively more difficult to solve for corresponding signals in the shorter wavelength harmonics from the existing SLR-derived time variable gravity results, although it appears that geophysical fluid mass transport is being observed. For example, the recovered J3 time series shows remarkable agreement with NCEP-derived estimates of atmospheric gravity variations. Likewise, some of the non-zonal harmonic components have significant interannual signal that appears to be related to mass transport related to climatic effects such as El Nino Southern Oscillation. We will present recent updates on the J2 evolution, as well as a complete movie of low-degree components of the time-variable gravity complete through degree 4, and examine possible geophysical/climatic causes.

## **Presentation Mode:**

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