Minkang
Cheng
Center for Space Research, The University of Texas at Austin
Oral
The figure axis of the Earth is the axis of maximum inertia for the deformed (oblate) Earth, which is characterized by the degree two and order one geopotential coefficients C21 and S21. Long-period fluid motion within the Earth's system (including the atmosphere, ocean, and surface water storage, or the Earth’s liquid core) will result in the difference between the figure axis and the mean rotation pole. 45-year Satellite laser ranging (SLR) data and 24-year GARCE/FRACE-FO data were analyzed to determine the variations in the Earth's figure axis represented by changes in C21 and S21 coefficients. The primary signature appears to be a non-hydrological long-term change in the SLR and GRACE time series of C21 and S21, which characterizes the Earth's figure axes variations related to the mean rotation axes represented by a 125-year mean. An important atmosphere-ocean induced wind torque on C21 is observed from SLR. A significant annual signal from SLR is in good agreement with the polar motion or EOP-inferred and the continental surface water redistribution-induced variation in C21/S21. However, the annual signal appears to be an underestimate by GRACE. A detailed analysis will be presented.
Presentation file
minkang-cheng_0.pdf
Meeting homepage
GRACE-FO 2025 Science Team Meeting
Download to PDF