Kaixuan Kang

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Education

2022	University of Colorado Boulder PhD Geophysics Advisor: *Prof.* Shijie Zhong
2008	Chinese Earthquake Research Institute, China MS Geophysics
2005	University of Wuhan, China BS Geodesy

Research Interests

Glacial isostatic adjustment, global climate changes, sea level projections, Holocene glacial retreat, mantle viscosity structure, finite element model

Research Experience

2023.06 – present	Postdoctoral Fellow, Institute for Geophysics, University of Texas at Austin (mentor: Prof. Thorsten Becker)
2023.06 – present	Postdoctoral Researcher, Department of Earth and Planetary Sciences, Harvard University (mentor: Prof. Jerry Mitrovica)
2023.01 – 2023.05	Postdoctoral Researcher, University of Colorado Boulder Projects: Study how to modify the existed ice models to improve the model-data misfit for both near- and far- field by using multiple published relative sea level datasets.
2016 – 2022	Doctoral Researcher, University of Colorado Boulder Projects: 3D finite element numerical model on the glacial isostatic adjustment (GIA); Investigation on the non-Newtonian rheology effect on the GIA modelling and observables; Constraints of relative sea level change on the Late Pleistocene Deglaciation History.
2014 – 2016	Associate Professor, Chinese Earthquake Research Institute Projects: Investigation on body tides and mantle anelasticity by using global GPS and national (China) surface gravity tidal observations; Comparison and integration of surface gravity observations and GRACE satellite measurements for hydrological loading problem.

2012 – 2014	Visiting Scientist with *Prof.* John Wahr, University of Colorado Boulder Projects: Stacking global GPS verticals and horizontals to solve for the fortnightly and monthly body tides and its implications for mantle anelasticity.
2008 – 2012	Assistant Professor, Chinese Earthquake Research Institute Projects: Estimating the effects of hydrological mass variations on inter-satellite high accuracy ranging system for gravity satellite; Database design and software development for the surface gravity observation collection and processing.

Teaching Experience

Spring 2019	Teaching Assistant, University of Colorado Boulder Courses Assisted: General Physics for undergraduate student Held weekly office hours, graded assessments, quizzes and exams, communicated with students

Honors/Awards

2023	Distinguished Postdoctoral Fellowship at Institute for Geophysics in the Jackson School of Geosciences, at the University of Texas at Austin
2015	Outstanding research paper, Chinese Earthquake Research Institute
2007	Merit student, Chinese Earthquake Research Institute
2005	Merit student, University of Wuhan
2004	Outstanding student Scholarship, University of Wuhan

Publications

Kang, K., & Zhong, S., (2023)Constraints of relative sea level change on the Late Pleistocene deglaciation history, Journal of Geophysical Research: Solid Earth (in review).

Zhong, S., **Kang, K.**, A, G. & Qin, C., (2022). CitcomSVE: A three-dimensional finite element software package for modeling planetary mantle's viscoelastic deformation in response to surface and tidal loads, *Geochemistry, Geophysics, Geosystems*, 23(10).

Kang, K., Zhong, S., Geruo, A. & Mao, W., (2022). The effects of non-Newtonian rheology in the upper mantle on relative sea level change and geodetic observables induced by glacial isostatic adjustment process. *Geophysical Journal International*, 228(3), pp.1887-1906.

Kang, K., & Bender, P. L., (2021). Improved measurements of short-period mass variations with future Earth gravity missions. Journal of Geophysical Research: Solid Earth, 126(1).

Peng, P., Zhu, Y., Zhong, M., **Kang, K.,** Du, Z., & Yan, H., (2016). Ice Mass Variation in Antarctica from GRACE Over 2002–2011. *Marine Geodesy*, 39(2), pp.178-194.

Kang, K., Wahr, J., Heflin, M. & Desai, S., (2015). Stacking global GPS verticals and horizontals to solve for the fortnightly and monthly body tides: Implications for mantle anelasticity. *Journal of Geophysical Research: Solid Earth,* 120(3), pp.1787-1803.

Kang, K., Li, H., Liu, S., Hao, H. & Zou, Z., (2015). Long-term gravity changes in Tibet and its vicinity before the Nepal Ms. 8.1 earthquake. *Geodesy and Geodynamics*, 5.

Kang, K., Li, H., Peng, P., & Zou, Z., (2015). Low-frequency variability of terrestrial water budget in China using GRACE satellite measurements from 2003 to 2010. *Geodesy and Geodynamics*, 6(6), pp.444-452.

Zou, Z., Li, H., **Kang, K.**, & Wu, Y., (2013). Characteristics of satellite-gravity variations in the North-south Seismic Belt before the 2013 Lushan earthquake. *Geodesy and Geodynamics*, 4(3), pp.1-6.

Kang, K., Li, H., & Wu, Y., (2012). Demonstration on the design of filter indexes of inter-satellite high accuracy ranging system for gravity satellite. *Chinese Journal Geophysics*, 55(10): 3240-3247.

Wu, Y., Li, H., Zou, Z., & **Kang, K.**, (2012). External calibration of GOCE data using regional terrestrial gravity data. *Geodesy and Geodynamics*, 3(3), pp.34-39.

Kang, K., Li, H., Peng, P., Hao, H., & Jin, W., (2011). Seasonal Variations in Hydrological Influences on Gravity Measurements Using gPhones. *TAO: Terrestrial, Atmospheric and Oceanic Sciences*, 22(2), p.1.

Xing, L., Li, H., Xuan, S., **Kang, K.**, & Liu, X., (2011). Long-term gravity changes in Chinese mainland from GRACE and ground-based gravity measurements. *Geodesy and Geodynamics*, 2(3), pp.61-70.

Presentations

Kang, K., "The effects of Non-Newtonian rheology on relative sea level change induced by glacial isostatic adjustment process and its implications on Antarctic ice sheet evolution". The Daly postdoctoral fellowship special seminar, Earth and Planetary sciences at Harvard University, 2023. Virtual *(ORAL)*

Kang, K., "3D finite element modeling for the glacial isostatic adjustment process". CESM Polar climate model and land ice winter working group meeting, NCAR, Boulder, CO, 2023. In person *(ORAL)*

Kang, K., Zhong, S., "Reconcile mantle viscosity structure inferred from using ANU and ICE6G ice models and multiple relative sea level datasets". AGU Fall, December, 2022. Chicago. *(POSTER)*

Kang, K., Zhong, S., Geruo, A., Mao, W., "The effects of non-Newtonian rheology in the upper mantle on relative sea level change and geodetic observables induced by glacial isostatic adjustment process". PALSEA-SERCE virtual workshop: Improving understanding of ice sheet and solid earth processes driving paleo sea level change. September 2021. Virtual *(ORAL)*

Kang, K., Zhong, S., "Can non-Newtonian rheology help reconcile far-field and near-field relative sea-level observations", AGU Fall, December, 2021. Virtual *(POSTER)*

Kang, K., Zhong, S., "The effects of non-Newtonian rheology in the upper mantle on GIA observables", AGU Fall, December, 2020. Virtual *(POSTER)*

Bender, P.L., **Kang, K.,** "Along track analysis of GRACE Follow-On mission data". AGU Fall, December, 2018. Washington, D.C. *(POSTER)*

Bender, P.L., **Kang, K.,** "Corrections for accelerometer noise for data from the GRACE Follow-On mission". AGU Fall, December, 2016. San Francisco. *(POSTER)*

Kang, K., Wahr, J.M., Heflin, M.B., Desai, S.D., "Stacking global GPS verticals and horizontals to solve for the fortnightly body tide". December, 2013. San Francisco. *(POSTER)*

Research grants

Investigation on body tides and mantle anelasticity by integration of GPS verticals and horizontals and national surface gravity tidal observations, 2015-2018. National Natural Science Foundation of China (NSFC), $120,000(PI).

Simulation on the effects of hydrological mass variations on inter-satellite high accuracy ranging system for gravity satellite, 2011-2013. National Natural Science Foundation of China (NSFC), $20,000(PI).

Services

Peer Review: Journal of Geophysical Research: Solid Earth, Geophysical Journal International, Geodesy and Geodynamics, Terrestrial, Atmospheric and Oceanic Sciences.

Skills

Language: Python, MATLAB, Fortran, C++, Shell scripting, SQL
Tools: Tensorflow, Scikit-learn, SciPy, Pandas, Matplotlib, Pyplot, seaborn
Model tech: Finite element numerical model, data assimilation, Kalman filter design, time series analysis, machine learning and neural network.

Professional affiliations

American Geophysical Union   updated August 2023