25th EMIW in September 11-17, 2022
Grand Hotel Ontur, Çeşme, Turkey
Session 2 "Theory, modeling and inversion"
Conveners Anna Kelbert, Hongzhu Cai, Jochen Kamm, Zhengyong Ren

ModEM software: An update on the improvements, availability, and performance metrics

Kelbert, A.[1,2], Egbert, G.[2], Dong, H.[3], Meqbel, N.[4], Zhongyin, L.[5]

1. *Geomagnetism Program, US Geological Survey, Golden, CO, USA*
2. *Oregon State University, Corvallis, OR, USA*
3. *China University of Geosciences, Beijing, China*
4. *3D Consulting-Geo GmbH, Berlin, Germany*
5. *Institute of Geology, China Earthquake Administration, Beijing, China*

ModEM 3D is a parallelized Fortran magnetotelluric (MT) modeling and inversion code [Egbert and Kelbert, 2012; Kelbert et al., 2014] that is freely available for academic use, and has been widely used for 3D MT modeling and inversion by the global MT community. Since the code was initially released, multiple extensions and improvements have been implemented. An upcoming release of an updated version of ModEM allows for flexible air layers and boundary conditions, flexible data orientations, and improved memory usage. It also includes an efficient sparse-matrix solver, a variety of inversion algorithms, and provides (with some limitations) for MT modeling in spherical coordinates. This updated version of ModEM 3D will be better suited for the modeling of electromagnetic induction in the Earth in the context of modern large-scale MT and space weather applications. We will report on the timelines and procedures for availability of these improvements and the related performance metrics, and on the budding efforts to share and distribute auxiliary toolboxes that provide assistance to scientists in setting up ModEM software and in the analysis of results.