IGRF-13 V-MOD Business Meeting
12 July 2019
Montreal, Canada
Chair: Erwan Thebault
Co-Chair: Patrick Alken

# Agenda

1. Acceptance of draft agenda
2. Report on IGRF-12 and evaluation
3. Status of WDMAM
4. Status of data available for IGRF-13 modeling
5. Presentation of IGRF-13 task force
6. IGRF-13 specification and call
7. Election of DIV-V-MOD chair and co-chair
8. Suggestions for sessions at IAGA/IASPEI 22-27 August 2021, Hyderabad, India
9. AOB

# Acceptance of draft agenda

Erwan starts the meeting, welcoming everyone and going through the draft agenda.

# Report on IGRF-12

Several models can be used to assess the quality of the IGRF-12, such as CHAOS (DTU), Dedicated Core field model from GFZ, WMM, and others. From 2010-2015, IGRF-12 matches CHAOS closely, due to the well resolved main field and SV at the two endpoints. After 2015 the model quality degraded quite rapidly. There are many differences at both low and high-latitudes between CHAOS/IGRF12 at 2019.0. The reason for the poor performance of IGRF-12 in 2015-2020 is attributed to a geomagnetic jerk occurring in late 2014, seen in many observatory time series. The jerk caused the linear SV prediction to be wrong in many areas of the globe.

There have been many publications regarding the acceleration of the geomagnetic north pole, and much public interest. The WMM2015 had to be revised in 2019 due to this. In fact the 2020 north pole velocity has slowed down since earlier epochs. The south magnetic pole velocity has changed little over the past 10 years or so.

IGRF12 was compared with a number of different models, including CHAOS, CM, DCO, WMM, and the median and mean of all models. IGRF differences are quite large (~50 nT rms) with regularly updated models, due mainly to the poor SV prediction. But the rms numbers are consistent with previous IGRF editions.

# Status of WDMAM

Previously, new datasets took a long time to be incorporated into the latest WDMAM. The procedure has been modified to incorporate new data on shorter time scales, and then have regular task force meetings to agree on and release new major updates to WDMAM. Recent new datasets include Brazil (1km x 1km), Russia, Antarctica (ADMAP), Caribbean. Currently the WDMAM is driven by 1 primary person (Y. Choi) with support from J. Dyment and V. Lesur. Any help and other datasets is highly welcome. An updated WDMAM is expected by end of the year. It will soon be time to work on v3.0 (there will be a call before the next IUGG).

# Status of data available for IGRF-13

Data available for field modelling were presented. Swarm magnetic field meausurements can be downloaded on the ESA web site together with some core field models for cross comparisons. More measurements such as DSMP, ePop are also available for field modelling.

Observatory measurements such as INTERMAGNET data are also available with probably a delay of a few months.

# Presentation of IGRF-13 task force

The current task force was presented. Nobody in the audience was willing to join.

# IGRF-13 specification and call

IGRF13 plans and specifications follow the IGRF12 in order to avoid undesirable steps in the Gauss coefficients. The candidate models are expected for October 2019. The IGRF13 will be released by January 2020. There are currently 10 declared institutions willing to submit a candidate model.

Japan proposed to submit an SV candidate model (will officially notify co-chair by August deadline).

C. Beggan sent some suggestions about the possibility to include/compute realistic uncertainties either in the spectral or the geographical domain. J. Dyment indicated that as a user he would be more interested in uncertainty maps rather than on uncertainties on Gauss coefficients. C. Finlay suggested that errors could be produced not by individual teams but by the task force for the release of the IGRF. He recognizes the difficulty for the task force to agree on such uncertainties. G. Hulot agrees that uncertainties based on comparisons between candidate models would be more useful. However, uncertainties for the SV is impossible as physical events such as jerks can occur without being predictible. V. Lesur said that it is very important that error bars are released for IGRF but the audience agreed on the fact that this needs a lot of computation in order to estimate these errors. This has to be done in the coming years with the IGRF task force, not necessarily for IGRF13.

Action item (P. Alken): after IGRF-13 work is completed, initiate dialogue among task force to determine a way forward on IGRF uncertainty estimates.

# Election of V-MOD chair and co-chair

C. Beggan and I. Wardinski introduced themselves and are candidates for the co-chair of IGRF. C. Beggan has been elected as a co-chair for 14/13 votes.

P. Alken has been elected for the next five years as chair of V-MOD working group.

# Suggestions for sessions at IAGA/IASPEI 2021

Suggestions for sessions. N. Olsen would like session names indicating new methodologies or explicitly the sources of the field.

1. Exploring the Earth's magnetic field from space (G. Hulot and C. Beggan).

Using magnetometry and other concepts

2. Lithospheric field modelling and tectonic implications (J. Dyment, V. Lesur)

3. Planetary magnetic fields and geomagnetic SV. (W. Brown, I. Wardinski and CC Finlay)

# Any other business