

IAG project QuGe: Novel Sensors and Quantum Technology for Geodesy

[WG Q.1: Quantum gravimetry in space and on ground](#)

Kick off meeting

26/01/2021

Minutes of the (Zoom) meeting

Attendees: Steffen Schön, Michel Van Camp, Franck Pereira, Jürgen Müller, Frederica Migliaccio, Ernst Rasel, Olivier Carraz, Jeff Kennedy, Thomas Lévèque, Axel Rülke, Nan Yu, Julian Glässel, Bastian Leykauf

Excused: Marie-France Lalancette, Yuichi Imanishi, Roland Pail, Shuqing Wu

14:05 Welcome and presentation of the agenda

14:07 Franck P. makes a general presentation of the QuGe project.

JM indicates that the number of members of the WG is up to us. The most important point is to have active members, representative of the relevant fields. One must pay attention to provide results in the coming 2.5 years. If the level is not high enough, the IAG may stop the project.

14:13 Franck P. presents the WG, its motivations, and presents the content already available on the project website (<https://quge.iag-aig.org/home>). He describes the way the members were chosen. Some of them expressed their interest during the preparation phase. Then the chairs aimed at opening the WG to the different communities (e.g., quantum physics, different parts of the world)

14:20 Presentations of the activities of the different members, eventually followed by questions/discussions. Presenters : Franck Pereira, Steffen Schön, Frederica Migliaccio, Ernst Rasel, Olivier Carraz, Jeff Kennedy, Thomas Lévèque, Axel Rülke, Bastian Leykauf (represents Berlin, Markus Krutzik), Nan Yu, Axel Rülke, Michel Van Camp (who presented himself as well as the members who could not attend : Marie-France Lalancette, Yuichi Imanishi, Roland Pail & Shuqing Wu).

16:12 A discussion followed on how to disseminate and liaise with relevant stakeholders/bodies/communities?

Liaison with other WGs, such as WGG-CCM (CIPM), other IAG groups, GGOS, Geodesy for Climate Research ... The proposition is made to first collect the names of working groups of interest and then inform them about us, and ask for a contact person. A possible future action could be to invite e.g. to participate in our meetings or special sessions. Every member here is required to provide names of WG he/she is aware of.

Discussion on which material to put online (on the website):

- Minutes of the meetings: OK

- List of publications. A first one is already present, could be updated, doi and link could be added.

Everybody is invited to complete the publication list.

- The name of the WG members. This is done.

- Some illustrations. For instance, time series from an atomic device e.g. from a coming BKG publication or from Berlin. Bastian L. asks about the data format. Michel VC remarks that there is no standard format for AG measurements. There is an existing IAG subworking group of commission 2 (2.1.2?) discussing that topic. Shall we invite them?

The website should remain simple. Just illustrate what is possible, with links and publications

- Present nice results, with a nice figure.

- Ernst R. proposes to provide links e.g. to different websites e.g. satellite mission projects.

16:35: Discussion on workshops e.g. joined workshops with other WGs.

So far, there will be sessions at

- EGU 2021: G4.1 & G4.4

- IAG Beijing 2021-06-28/2021-07-02: own QuGe symposium. More informations are to come.

We could propose a session AGU Fall meeting. NASA organized last year a session on quantum technologies. A dedicated AGU session is a good idea. Nan Yu can help. Michel VC follows the opening of the session submission for Fall meeting 2021 (in New Orleans if not virtual).

Franck P: can we expect some support from IAG if we organize something ?

Jürgen M: Nearly no budget, we would have to organize it ourselves. We can use IAG as an umbrella.

Shall we organize a specific QuGe workshop: 2022, 2023?

16:45 Other ideas

- Contribute a review paper? A kind of "Reviews of Geophysics".

Steffen S: There are a lot of engineering problems that require solutions. There are enough papers about dreams, we should be practical first. What is the most urgent research needed in order to make our dreams alive?

- Propose a COST action: there was already two in the recent years: one on Quantum Technologies with Ultra-Cold Atoms (AtomQT) and another one on quantum technologies for space (QT Space). Maybe better to do it at the level of the IAG project. An action is to contact the chair of AtomQT (Wolf Von Klitzing) to get some information on that tool.

- organize regular meetings: what would be the agenda? Shall we target specific topics each time? Ask experts from different communities to make presentations? We shall use our meetings to fill the gap in knowledge from both communities: physics vs. geodesy.

Ernst R.: Companies have also a problem, by not always knowing what end users need: what do we need? Is it stability? Continuous measurements? Precision? For example: navigating with gravity maps, exploration: what do they need?

Presentations could present the needs from the different communities: companies, geodesists, physicists.

- When do we meet next (beyond meeting at sessions in conferences)? Proposition to hold the next meeting in May/June, could be two half a day meetings (rather than a full day). Objectives: get a clear idea of the situation with quantum sensors, and identify the needs from the communities. Who may be invited? Some propositions: Michel VC could present on terrestrial, Roland Pail on space

missions. Members of the group could provide input, and/or propose some experts. Idea of making this meeting accessible to everybody (at least relevant communities).

Nan Yu suggests different talks from science and technology. It doesn't have to be at the same time. We could spread over 6 months and have time to discuss. More continuous discussion with the speaker. In practice, much better than two days talk back to back.

17:15 End of the meeting

LIST OF ACTIONS

Action Item #	Title	Responsible	Due date/close out date	Status
A11	Provide names of relevant WG, and contact persons	All	15/02/2021	Open
A12	Provide relevant missing publications to update the publication list online	All	15/02/2021	Open
A13	Provide other material for the website: illustrations, project description and link to website ...	All	15/02/2021	Open
A14	Follow the call for submission of sessions at AGU	MVC	TBD	Open
A15	Propose sessions at AGU	All	TBD	Open
A16	Provide details on the information on the organization of the IAG scientific assembly	JM-MVC	TBD	Open
A17	Contact WvK about COST programs	FP	15/02/2021	Open
A18	Contact ORB contract office about COST programs	MVC	15/02/2021	Open
A19	Propose topics/experts for talks for the next meeting	All	10/02/2021	Open
A110	Setup a quick meeting to discuss the organization of the next meeting	FP	01/02/2021	Open