GFZ Analysis Center

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Abstract

This report briefly provides general information and a component description of the recently established IVS Analysis Center at GFZ and outlines the planned activities.

1. General Information and Component Description

Helmholtz Centre Potsdam, GFZ German Research Center for Geosciences, is the national research center for Earth Sciences in Germany. The main tasks of GFZ according to its Web site (www.gfz-potsdam.de) are:

> *We investigate System Earth at locations all over the world with all the geological, physical, chemical and biological processes which occur at its surface and in its interior. The goal of our interdisciplinary research is to understand these processes on all scales of time and space, whether they occur at the level of atoms and molecules or galaxies, and independently of whether they take place faster than [...] nanoseconds or if they happen infinitely slowly over billions of years. We not only investigate the processes within the planet itself, but also study the multitude of interactions between solid earth, the atmosphere, the hydrosphere and the inhabited world. We also analyse how man, living at the Earth's surface, affects our planet. In sum, our research deals with the entire 'Earth System' including the influence of mankind.*

At this research facility within Department 1 'Geodesy and remote sensing' and its Section 1.1 'GPS/GALILEO Earth observation' a new VLBI group was established in November 2012.

2. Staff

At the GFZ IVS AC the operational work is done by Robert Heinkelmann and Tobias Nilsson. In addition, Maria Karbon works in a project about the application of Kalman filter to VLBI analysis, and Virginia Raposo works on the ICRF and related systematic effects. Harald Schuh is managing our group, and, as long as his schedule allows, he is still very active for the IVS. A photo of our group is shown in Figure 1.

3. Future Plans

- IVS Associate Analysis Center at GFZ

  At GFZ we will use VieVS for VLBI data analysis starting at DB version 4 or a higher level. We will develop VieVS together with the IVS Analysis Center at the Department of Geodesy and Geoinformation, Vienna University of Technology.

- Space applications

  Our scientific work will focus on VLBI applications in space, on space navigation by differential VLBI, and on co-location in space of the various space geodetic techniques (VLBI, GNSS, SLR, and DORIS).

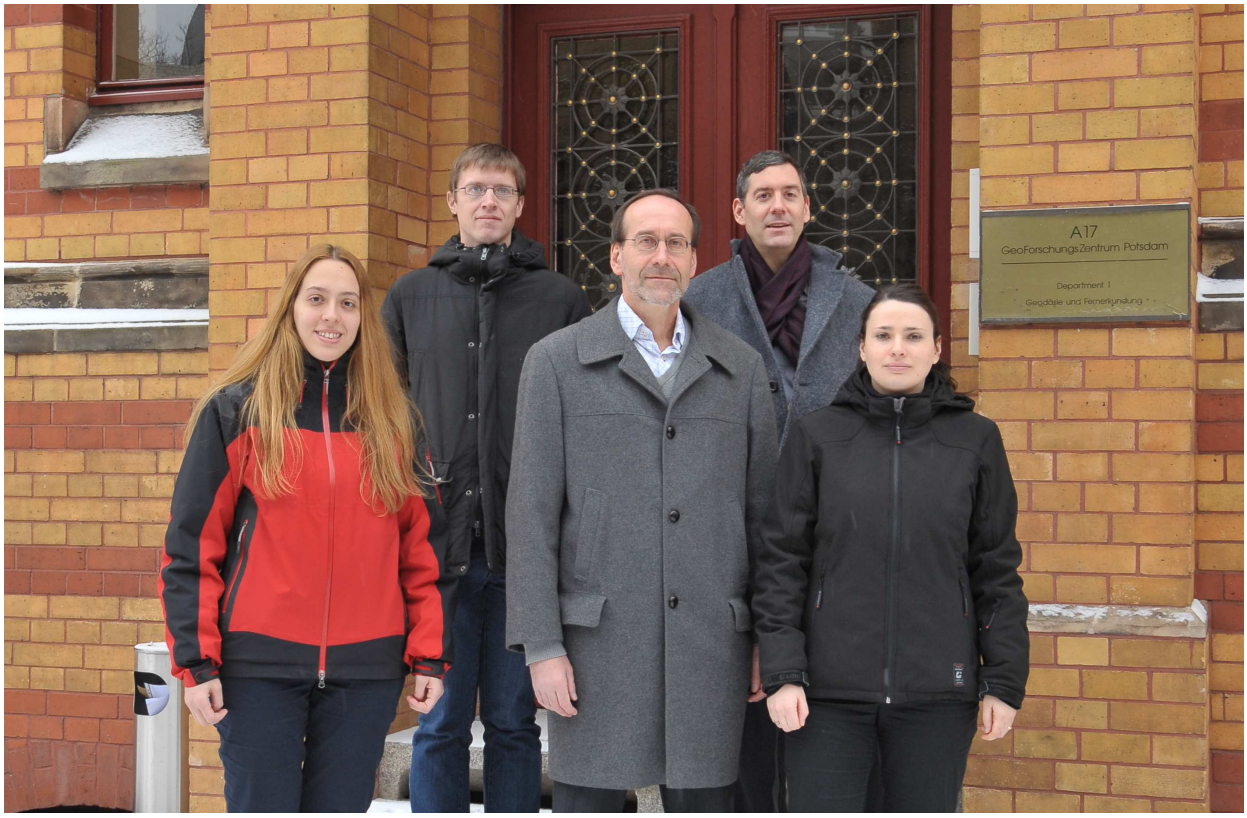

Figure 1. The GFZ VLBI group in January 2013.

- Kalman filtering for VLBI analysis with VieVS

  We will implement a Kalman filter solution in VieVS. It will be optimized in order to be able to analyze VLBI data in near real-time, and it will also allow for inclusion of data from other sensors, such as water vapor radiometers.

- Rapid troposphere combined product

  It is planned to take over the rapid troposphere combination from DGFI (Deutsches Geodätisches Forschungsinstitut) at GFZ.

References

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[2] Schuh H. and Behrend D.: VLBI: A fascinating technique for geodesy and astrometry. J Geodyn 61, DOI:10.1016/j.jog.2012.07.007, 68–80, 2012.

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