

BKG/DGFI Combination Center Annual Report 2008

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Abstract

This report summarizes the activities of the BKG/DGFI Combination Center in 2008 and outlines the planned activities for the year 2009.

1. General Information

The BKG/DGFI Combination Center has been established jointly by the Federal Agency for Cartography and Geodesy (Bundesamt für Kartographie und Geodäsie, BKG) and the German Geodetic Research Institute (Deutsches Geodätisches Forschungsinstitut, DGFI). BKG is a German federal authority assigned to the Federal Ministry of the Interior. Its tasks include, among others, the provision of geodetic reference data and basic spatial data for the needs of the Federal Government—the administrative, economic, and scientific sectors—as well as for the citizens. DGFI is an autonomous and independent research institution located in Munich. It is run by the German Geodetic Commission (Deutsche Geodätische Kommission, DGK) at the Bavarian Academy of Sciences. The research covers all fields of geodesy and includes the participation in national and international projects as well as functions in international bodies.

The joint BKG/DGFI Combination Center was inaugurated by the IVS Directing Board in October 2008. The tasks of this IVS Combination Center include quality control and a timely combination of the session-based intermediate results of the IVS Analysis Centers into a final combination product (e.g., Earth Orientation Parameters, EOP). After consultation with the IVS Analysis Coordinator, the combination results will be released as official IVS products. The Combination Center is also expected to contribute to the generation of the official IVS input to any ITRF activities. These tasks should be performed on an operational basis.

2. Component Description

The BKG/DGFI Combination Center will perform a combination of session-based results of the IVS Analysis Centers on an operational basis. The strategy for the combination will be adapted from the combination process currently done by the IVS Analysis Coordinator as described in [1]. Combination will be done for the two IVS EOP series (rapid and quarterly solutions) on the basis of datum-free normal equations in SINEX format.

According to the joint proposal, the following Combination Center functions will be performed at BKG:

- Ensure quality control of the Analysis Center results: Check the format of the results and their suitability for combination, perform identification and reduction of outliers, compare the Analysis Centers' results against each other and compare the results w.r.t. external time series, e.g. from IERS or IGS.
- Provide feedback to the Analysis Centers: Quality control results will be available at the BKG/DGFI IVS Combination Center Web page. If preferred by the Analysis Centers, the results will be provided by e-mail, too.

- Create high quality combination products and perform timely archiving and distribution: Combination products will be created using the DGFI DOGS software package, which operates by the combination of unconstrained (free) normal equations.
- Submit official IVS combination products to the IERS: The produced official IVS combination products will be submitted to the responsible IERS components as requested by the IERS. This will be supported by the staff of the IERS Central Bureau at BKG.
- Place final results in IVS Data Centers: Final results will be placed in the BKG Data Center. This will be assisted by the staff of the BKG Data Center in Leipzig.
- Generate official IVS input to the ITRF: Official IVS input to the ITRF will be created as combined weekly solutions in SINEX format.

DGFI will be in charge of the below-mentioned Combination Center functions:

- Develop state-of-the-art combination procedures: State-of-the-art combination procedures will be developed mainly at DGFI. This work, as well as the following item, is also related to DGFI's efforts as an IERS Combination Research Center and an IERS ITRS Combination Center.
- Perform software development and documentation: At DGFI the DOGS software package will be continuously updated by implementing the developed state-of-the-art combination procedures.
- Adhere to IERS Conventions: The DGFI DOGS software package is continuously updated to be as much as possible in accordance with the IERS Conventions.

3. Staff

The list of the staff members of the BKG/DGFI Combination Center is given in Table 1.

Table 1. Staff members of the BKG/DGFI Combination Center.

Name	Affiliation	Function	E-Mail
Michael Gerstl	DGFI	Software maintenance	gerstl@dgfi.badw.de
Robert Heinkelmann	DGFI	Combination strategies	heinkelmann@dgfi.badw.de
Alexander Lothhammer	BKG	Hardware maintenance	alexander.lothhammer@bkg.bund.de
Wolfgang Schwegmann	BKG	Combination	wolfgang.schwegmann@bkg.bund.de

4. Current Status and Activities

In June 2008 the IVS Directing Board solicited proposals for the installation and operation of IVS Combination Centers. The joint proposal of BKG and DGFI to become an IVS Combination

Center was accepted by the IVS Directing Board at the 20th Board meeting in Penticton, BC, Canada on September 13, 2008.

After inauguration of the joint BKG/DGFI Combination Center by a letter from the Chair of the Directing Board on October 21, 2008, the work for this new IVS component started. In 2008 the hardware to perform the analysis has been acquired and a first meeting with the IVS Analysis Coordinator has taken place on December 3, 2008. At this meeting the transition of the operational combination to the BKG/DGFI Combination Center in 2009 has been planned.

5. Plans for 2009

In 2009 BKG and DGFI will start the IVS Combination Center with the final goal to take over the operational combination of the session-based results of the IVS Analysis Centers from the IVS Analysis Coordinator. Following steps will be undertaken to reach this goal:

- Installation of DOGS Software and additional scripts for combination on dedicated hardware.
- Perform combination in parallel with the operational combinations done at the IVS Analysis Coordinators office.
- Compare results with those obtained in operational combination; discover and resolve problems.
- Take over operational combination tasks at latest October 1, 2009.

References

- [1] Nothnagel, A., Böckmann, S., Artz, T., Analysis Coordinator Report, In: International VLBI Service for Geodesy and Astrometry 2007 Annual Report, NASA/TP-2008-214162, D. Behrend and K. D. Baver (eds.), 16–17, 2008.