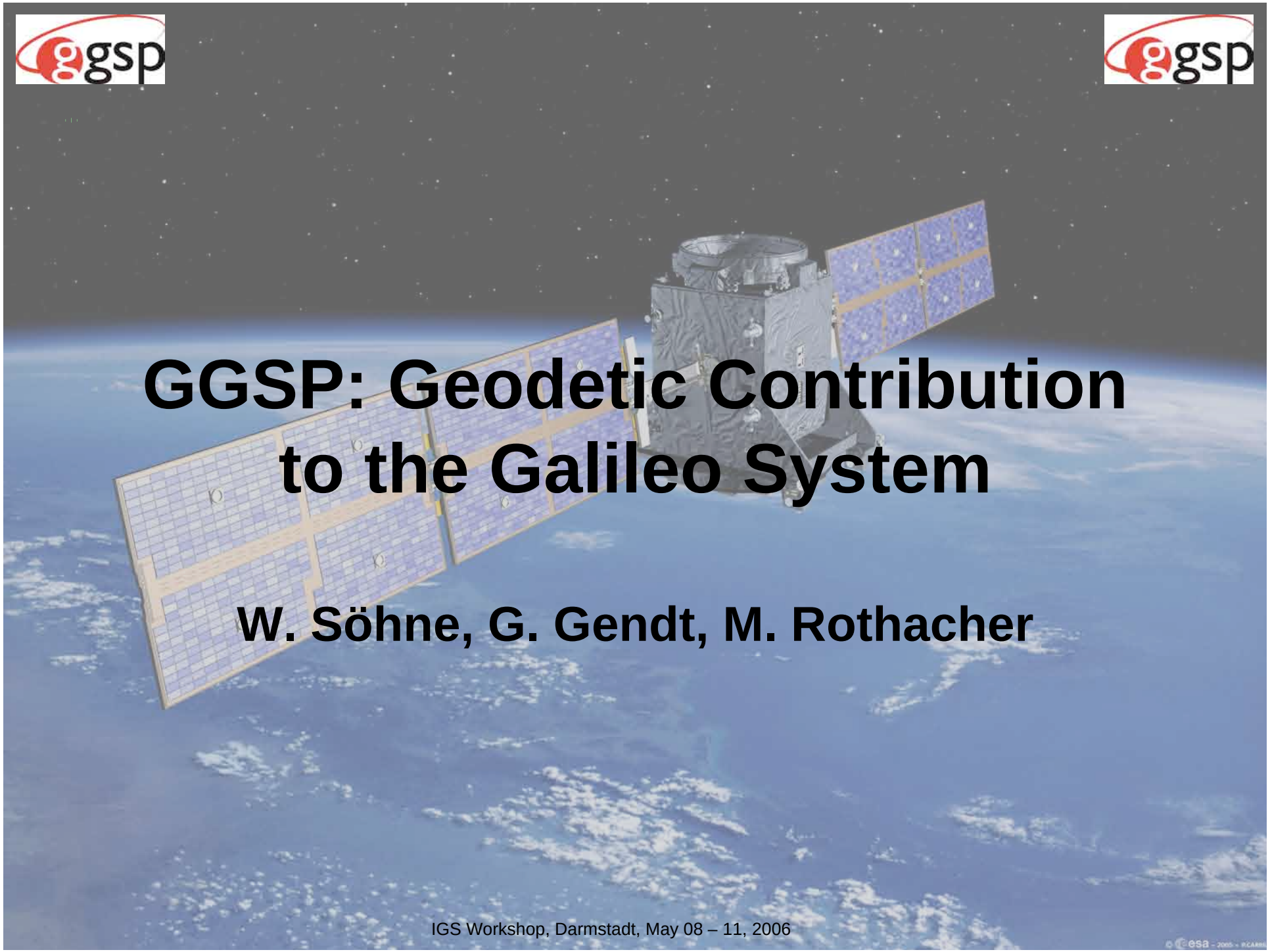

GGSP: Geodetic Contribution to the Galileo System

W. Söhne, G. Gendt, M. Rothacher

IGS Workshop, Darmstadt, May 08 – 11, 2006

Content

- GGSP Prototype consortium
- Background
- Project structure and interfaces
- GTRF
- Summary

GGSP Prototype Consortium

GFZ POTSDAM

AIUB Astronomisches Institut der Universität Bern

bkg

ESOC OPERATIONS CENTRE FOR THE EUROPEAN SPACE AGENCY

IGN INSTITUT GEOGRAPHIQUE NATIONAL

WUHAN UNIVERSITY

Natural Resources Canada / Ressources naturelles Canada

GGSP Prototype Team

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Background

- 6th Framework Programme of the EC
  - "Community activities in the field of research, technological development and demonstration"
  - 2002-2006
  - 17500 million Euro
- Thematic area "Aeronautics and Space", 1075 million Euro
- Topic "Galileo – development of multisectoral systems, equipment, tools and user equipment"

Background

- 6th Framework Programme of the EC
- Galileo 6FP 2nd Call in June 2004
  - 66.9 million Euro
  - Area 2 “Mission definition and implementation”
  - Call 2420 “Implementation of Galileo Geodetic Service Provider Prototype”

Background

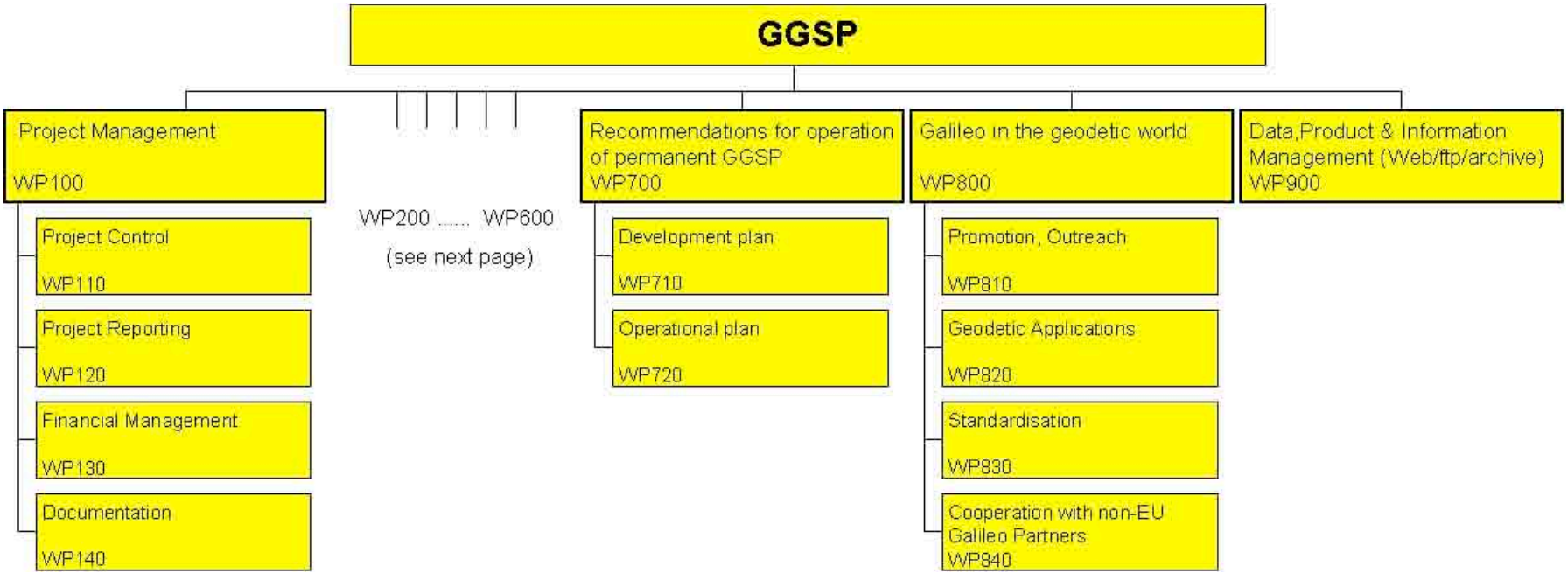
Statement of Work (SoW):

“ (…) In order to benefit from this extensive level of existing expertise in the geodetic community, Galileo will refer to an external entity called the GGSP for a number of geodetic functions.”

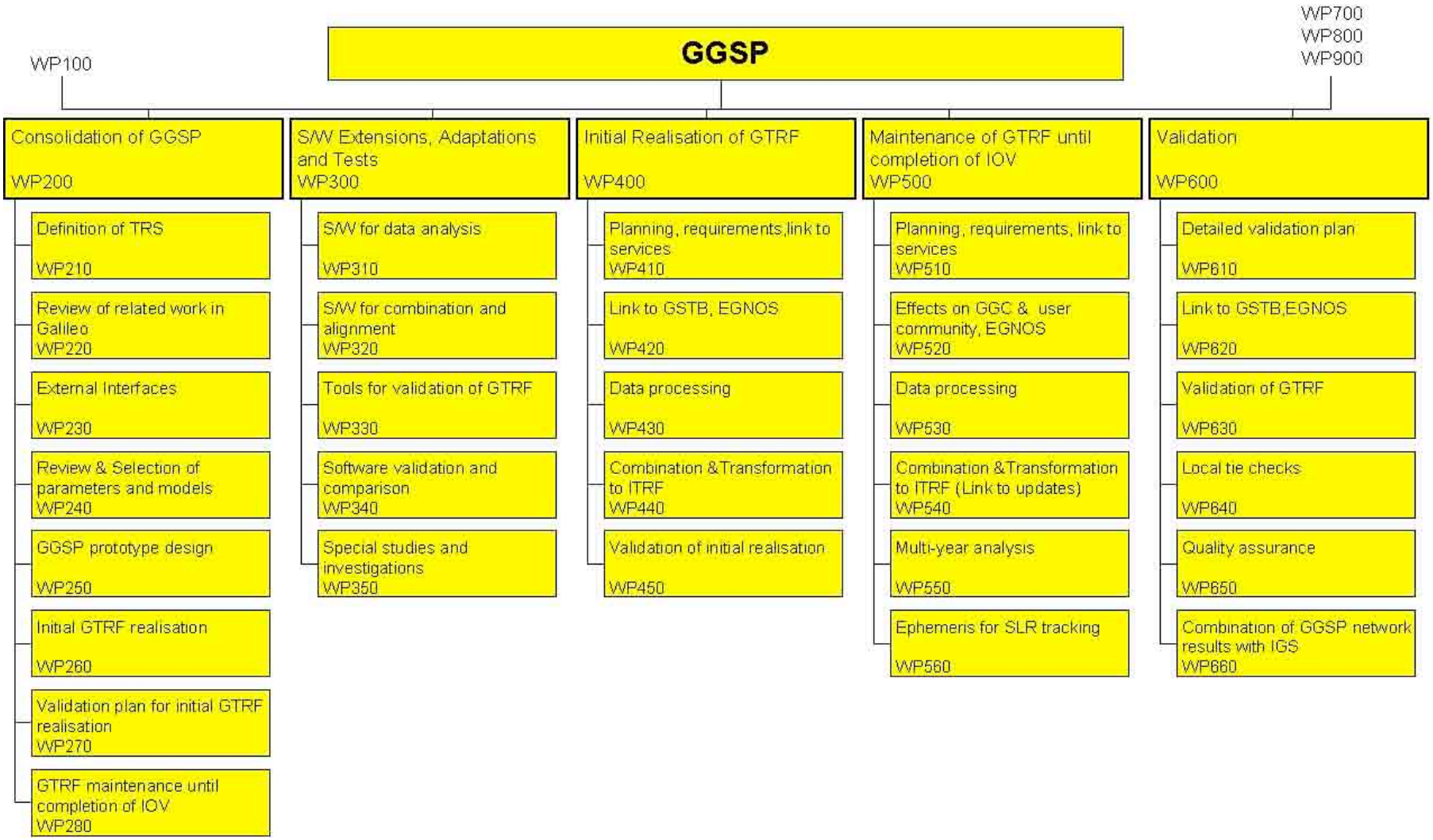
Background

- Development of Galileo Terrestrial Reference Frame and establishment of service with products and information for potential users
- Main actions of GGSP Prototype:
  - GTRF Definition
  - GTRF Realization
  - GTRF Maintenance
  - GTRF to IERS Link
  - Galileo to ILRS Link
- Contract with Galileo Joint Undertaking
- Start ("Kick-Off") July 2005

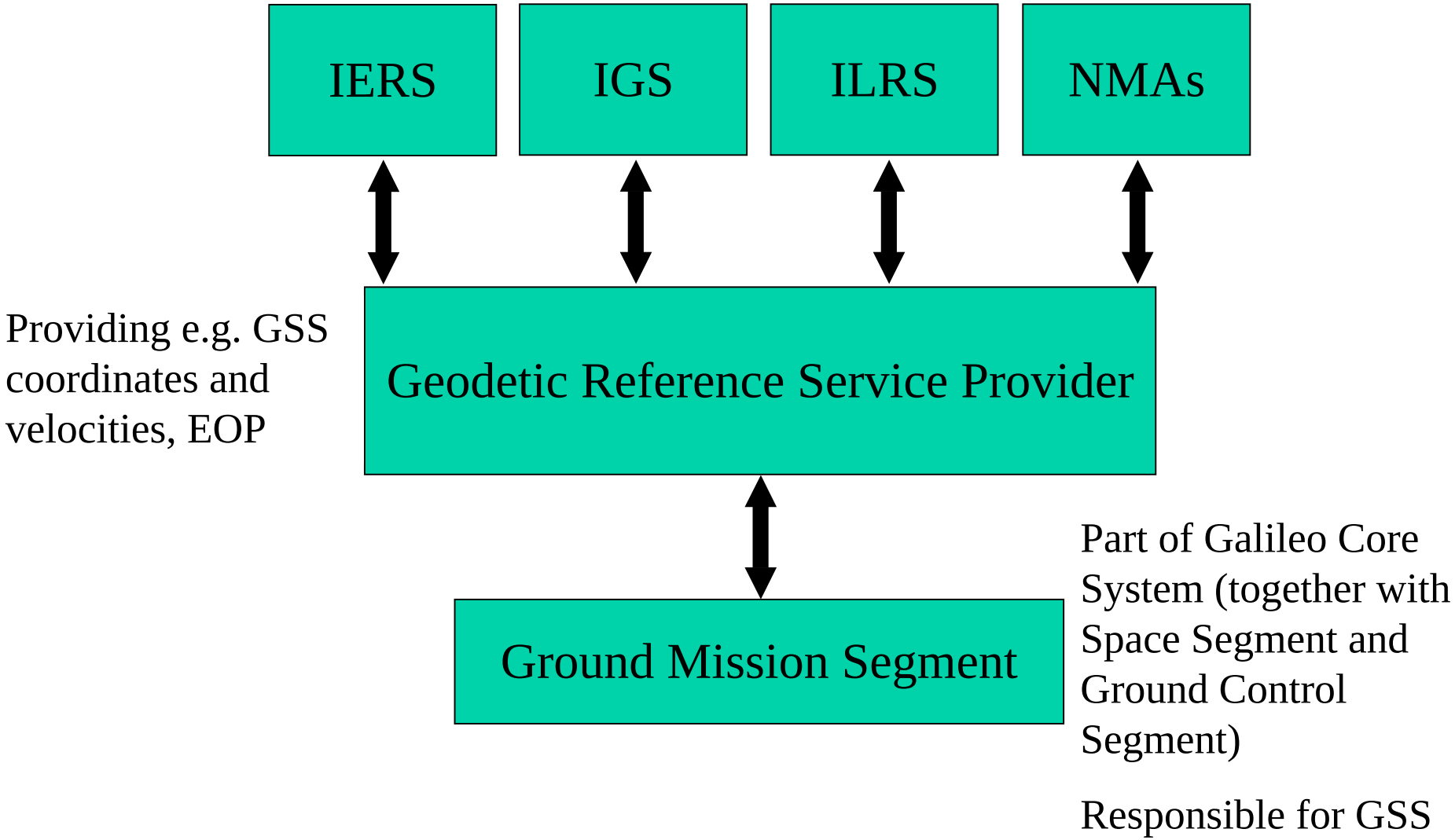
GGSP WP Structure



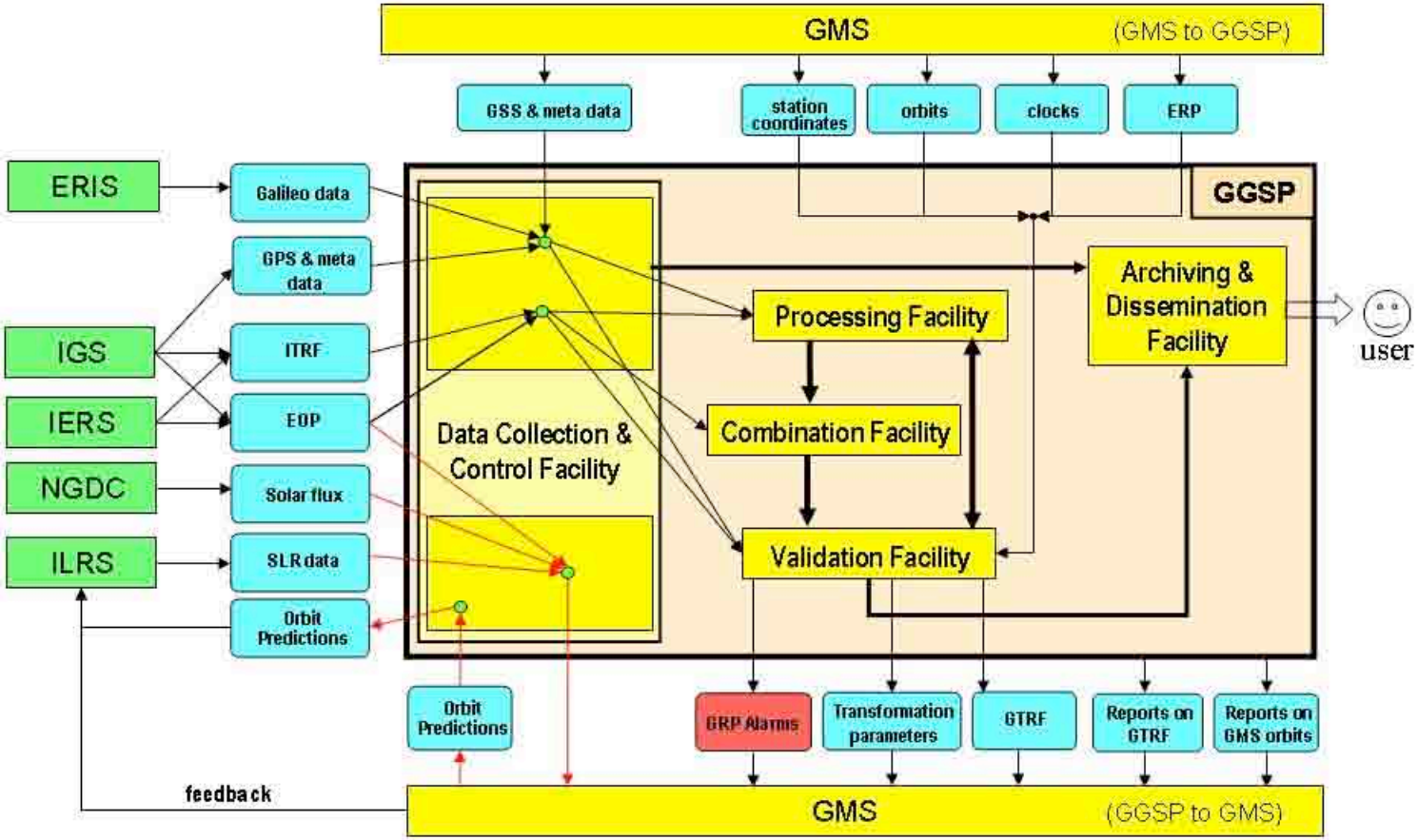
GGSP WP Structure



GGSP external interfaces



GGSP Architecture



GTRF

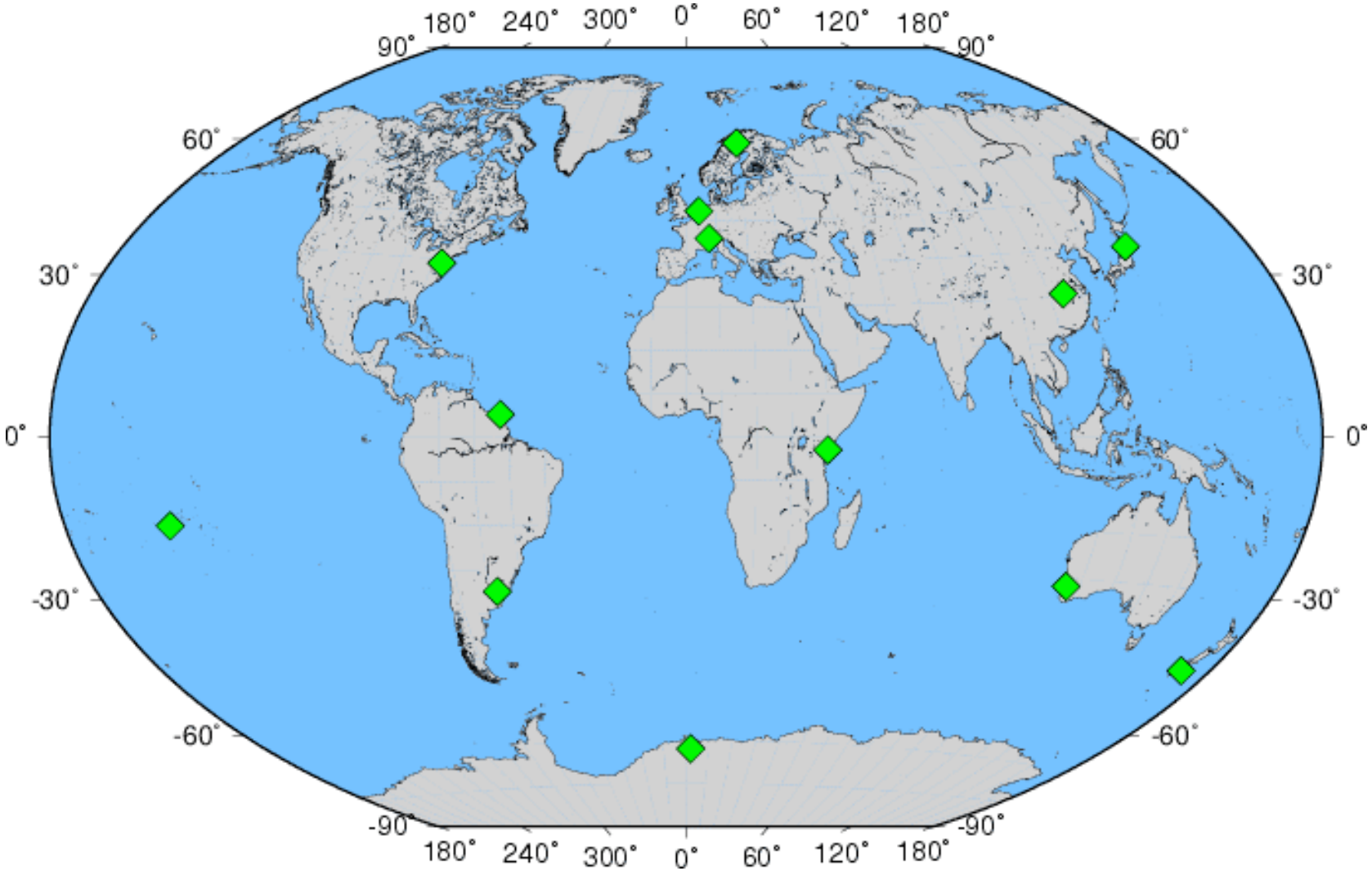
- Core network for GTRF realization: Galileo Sensor Stations (GSS)
- Additional sites to fill gaps, e.g. from IGS
- Galileo Terrestrial Reference Frame to be consistent within 3 cm (2 sigma) to ITRF
- Final distribution of Galileo Sensor Stations (GSS) still under examination
- First stage of GTRF realization with GPS only

GTRF

- **Galileo Sensor Station (GSS)**
  - **The Galileo Sensor Station is in charge of obtaining the Signal In Space observables for Navigation and Integrity**
  - **Various requirements concerning e.g. receivers, clocks, network, power supply etc.**
  - **Planned GSS: 18 for IOV + 22 for FOC**
  - **5 at TT&C/ULS/GSS, 4 at ULS/GSS, 31 at GSS**

GTRF

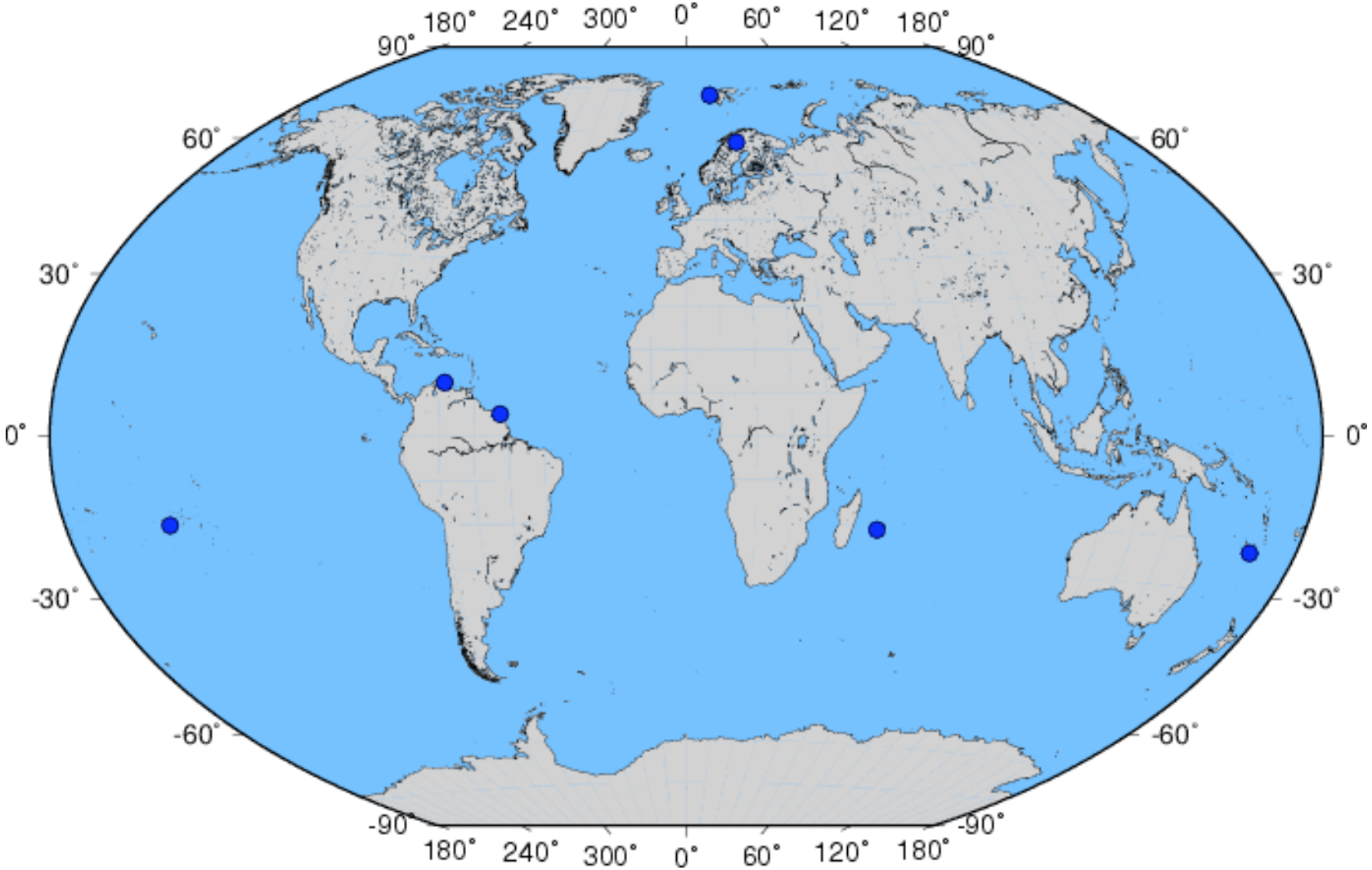
GSTB-V2 site distribution



GSTB stations only used for testing of interfaces etc.

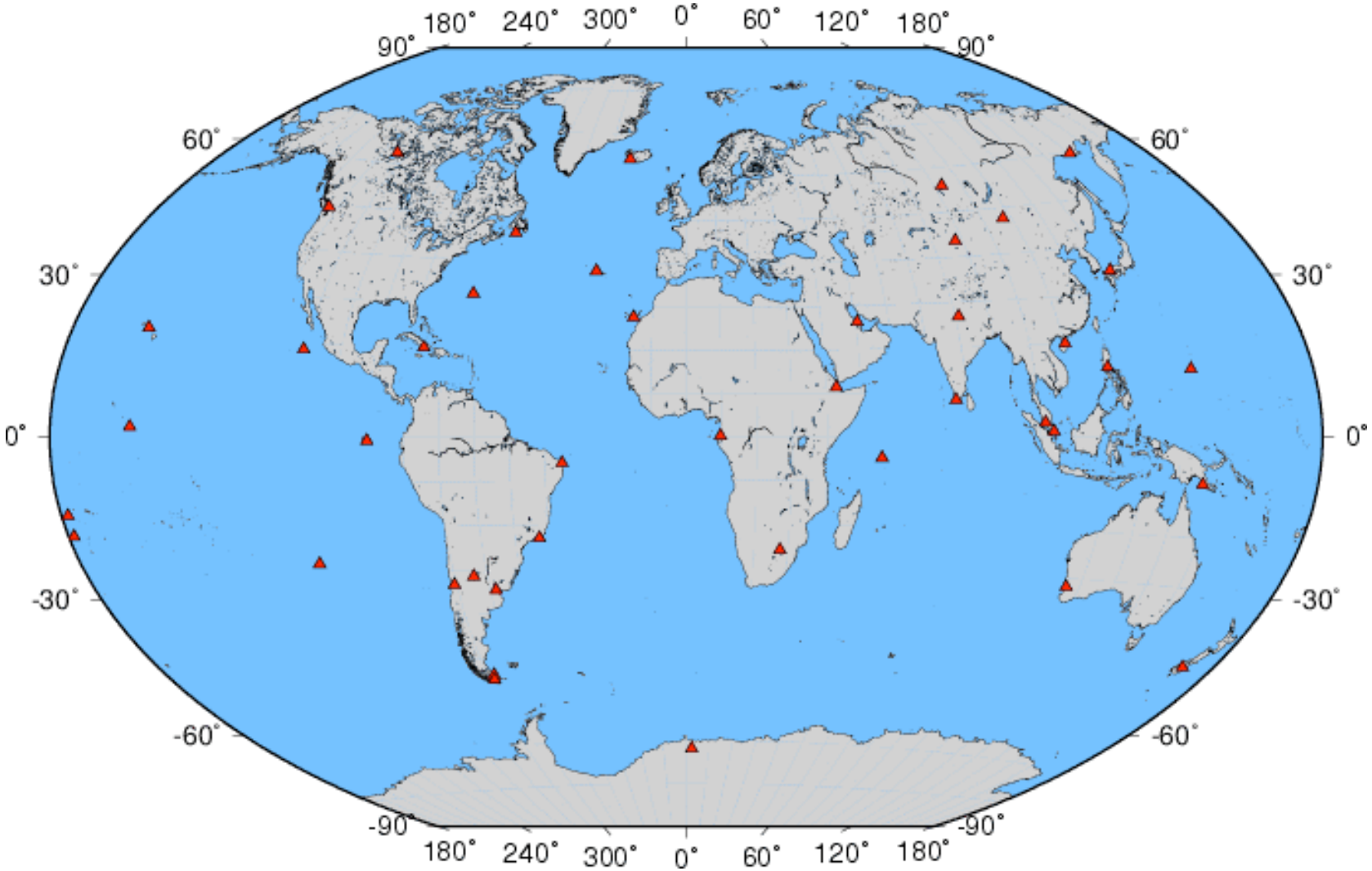
GTRF

Uplink Stations (ULS)



GTRF

Potential Galileo Sensor Stations (GSS)



Number and distribution of GSS still in construction

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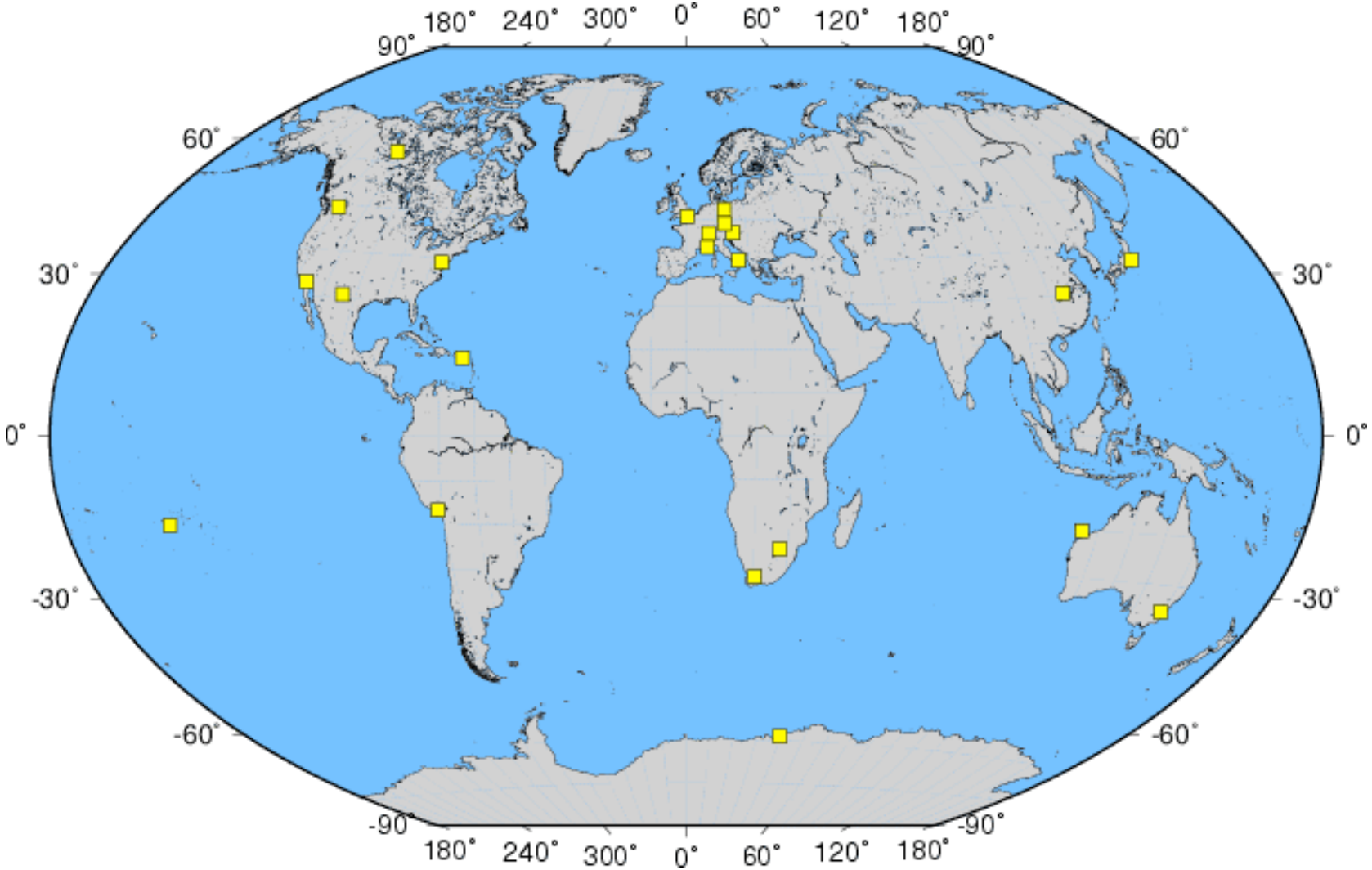
GTRF

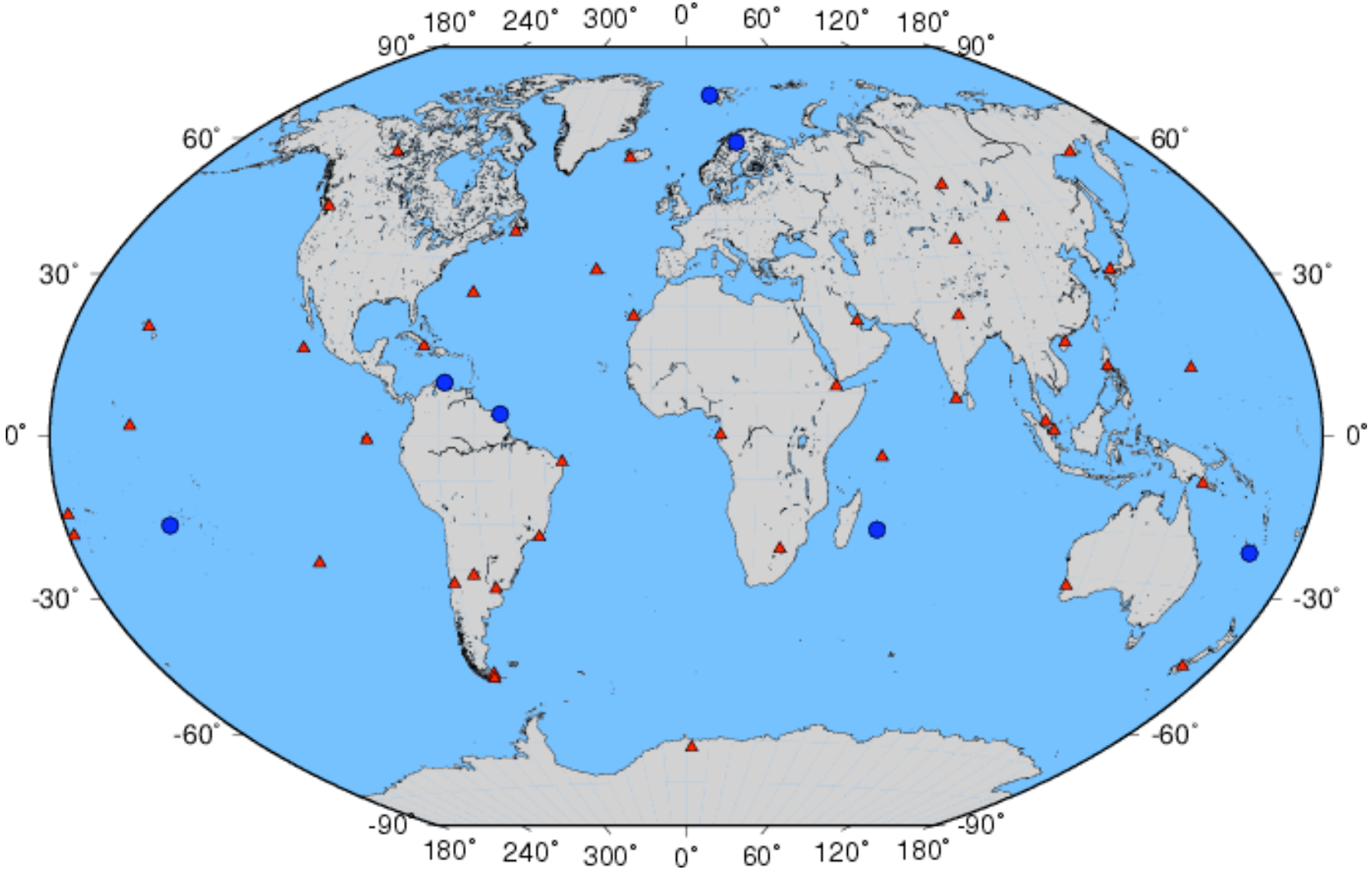
SLR Stations (ILRS)



Only stations co-located (at least) with GPS

GTRF

ULS + GSS

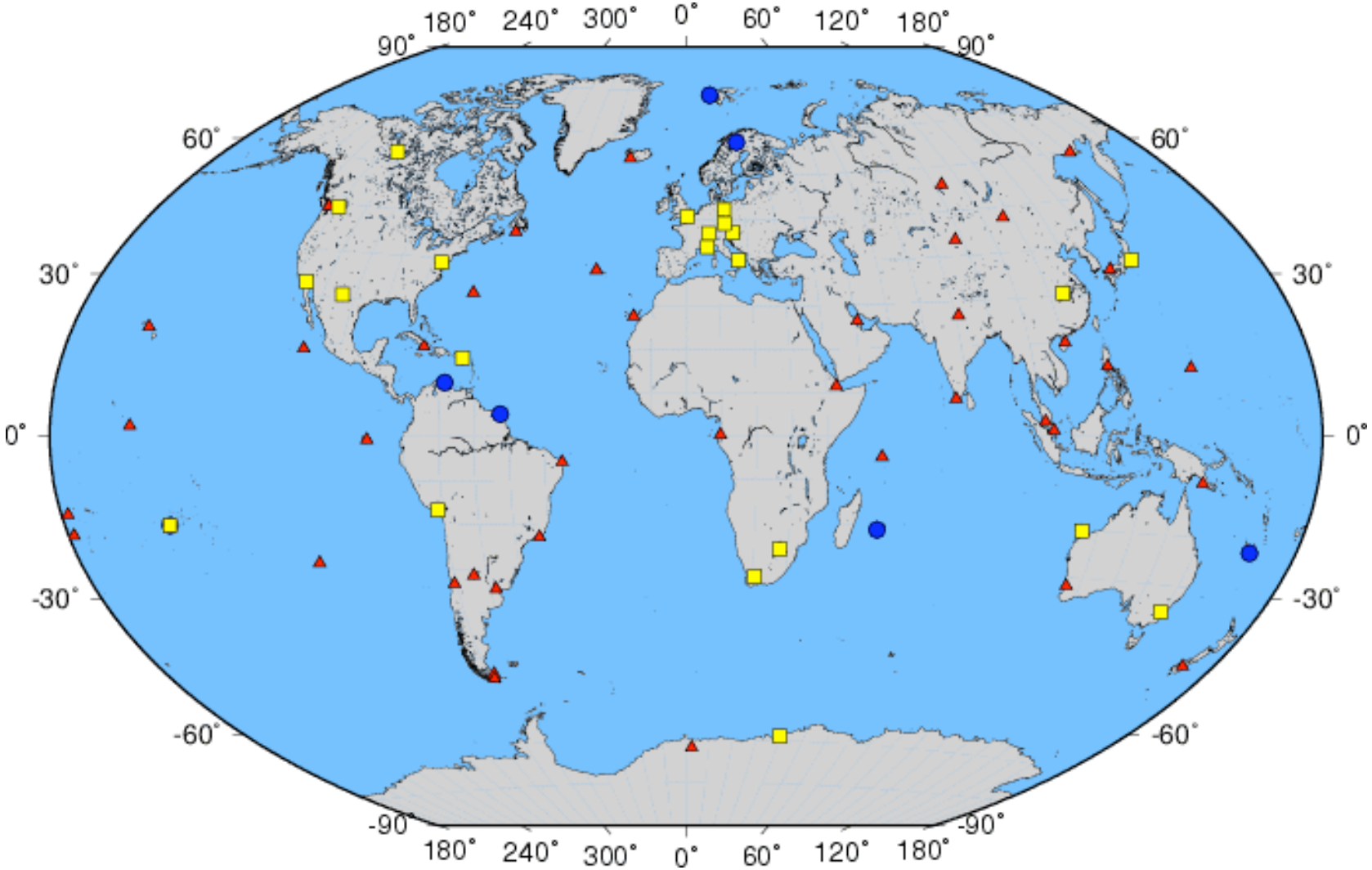


GSS not available for initial realization replaced by nearby IGS

Söhne et al.: “GGSP: Geodetic Contribution to the Galileo System”

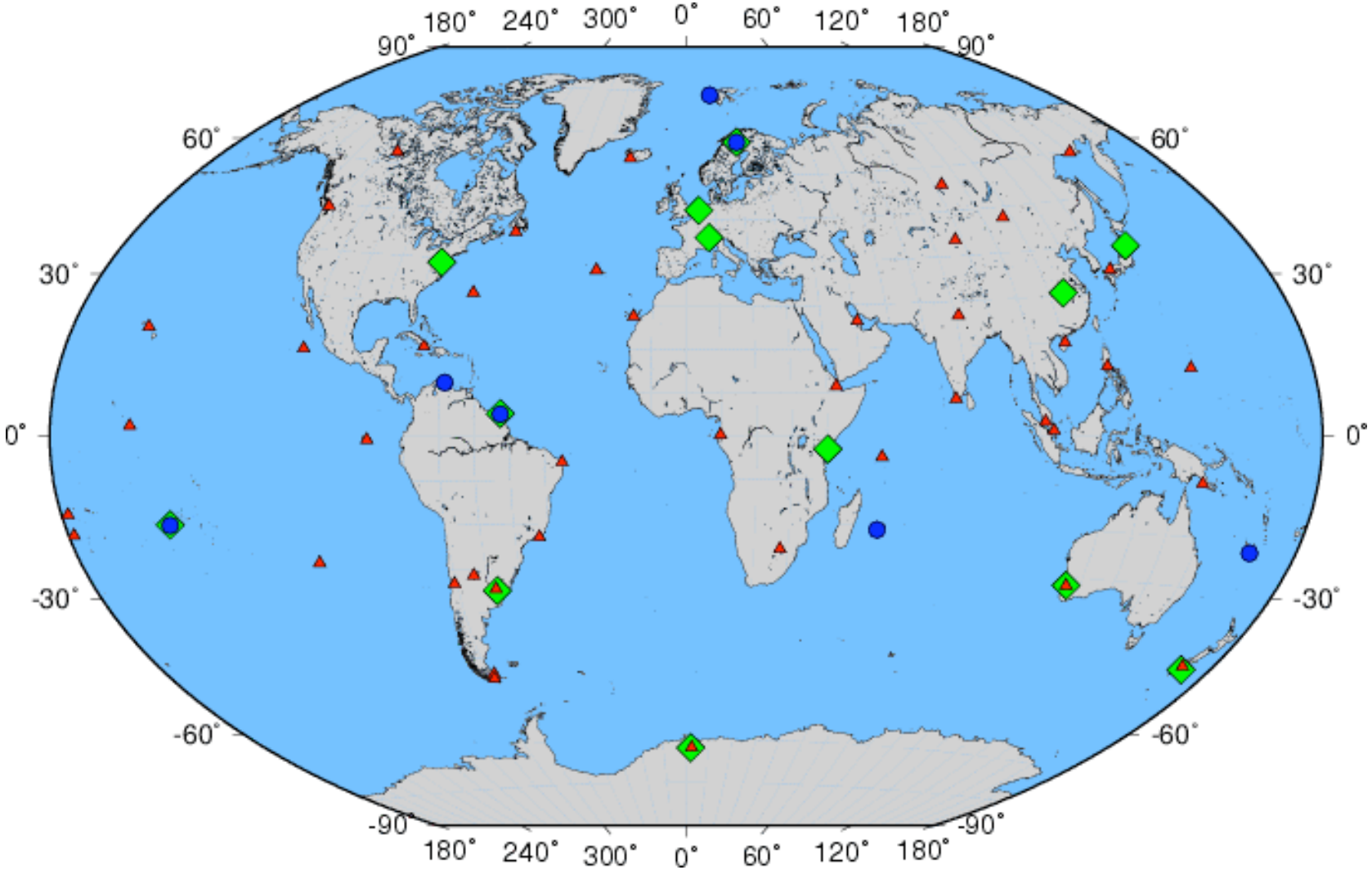
GTRF

ULS + GSS + ILRS

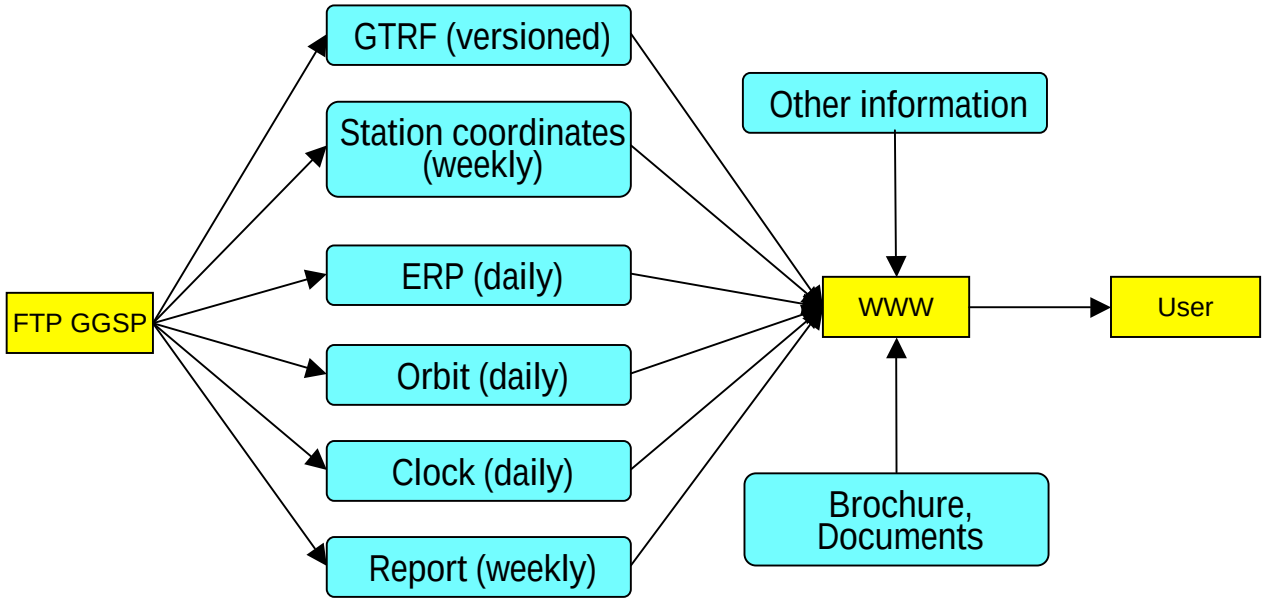


GTRF

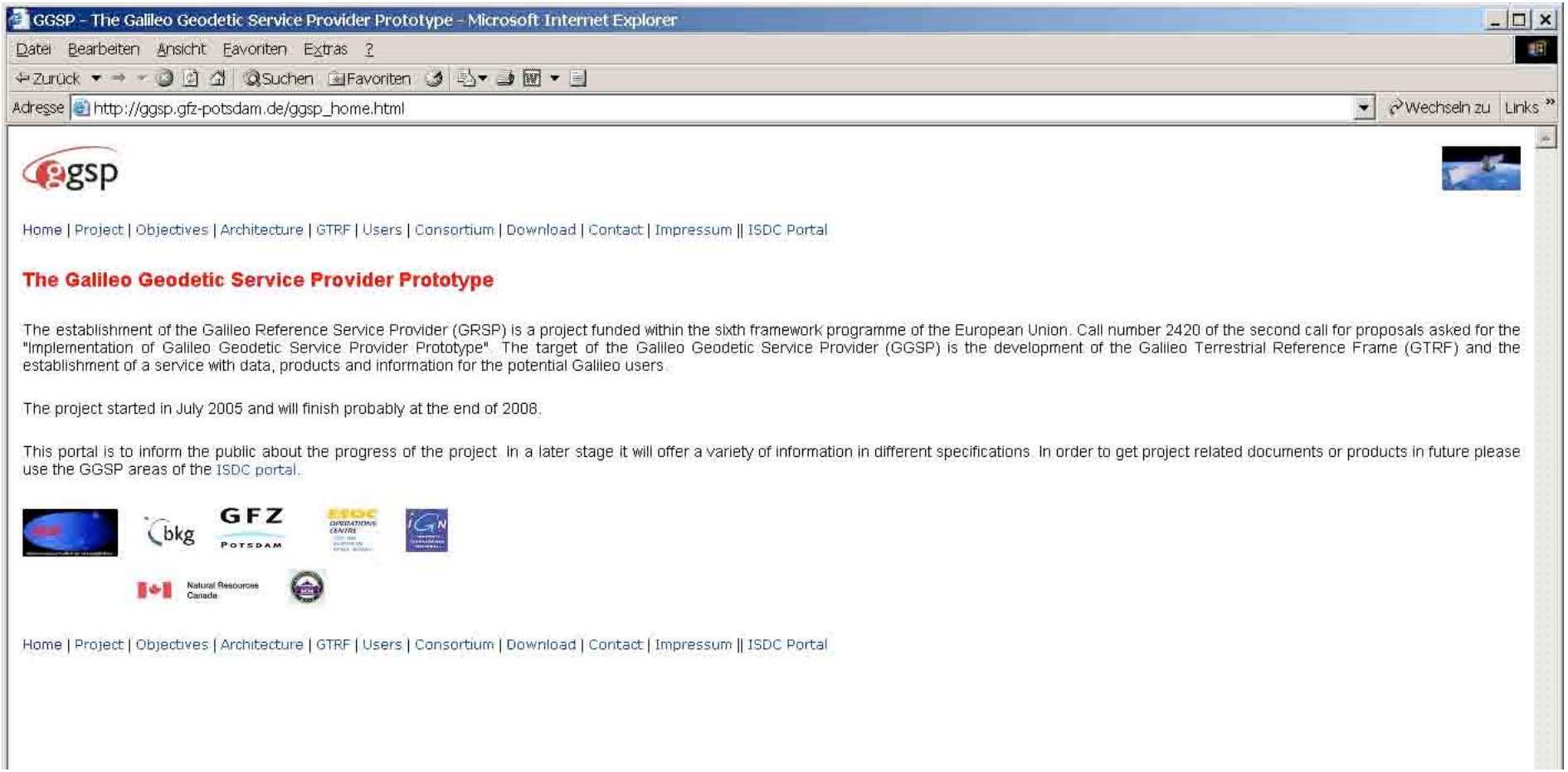
GSTB + ULS + GSS



GGSP Products

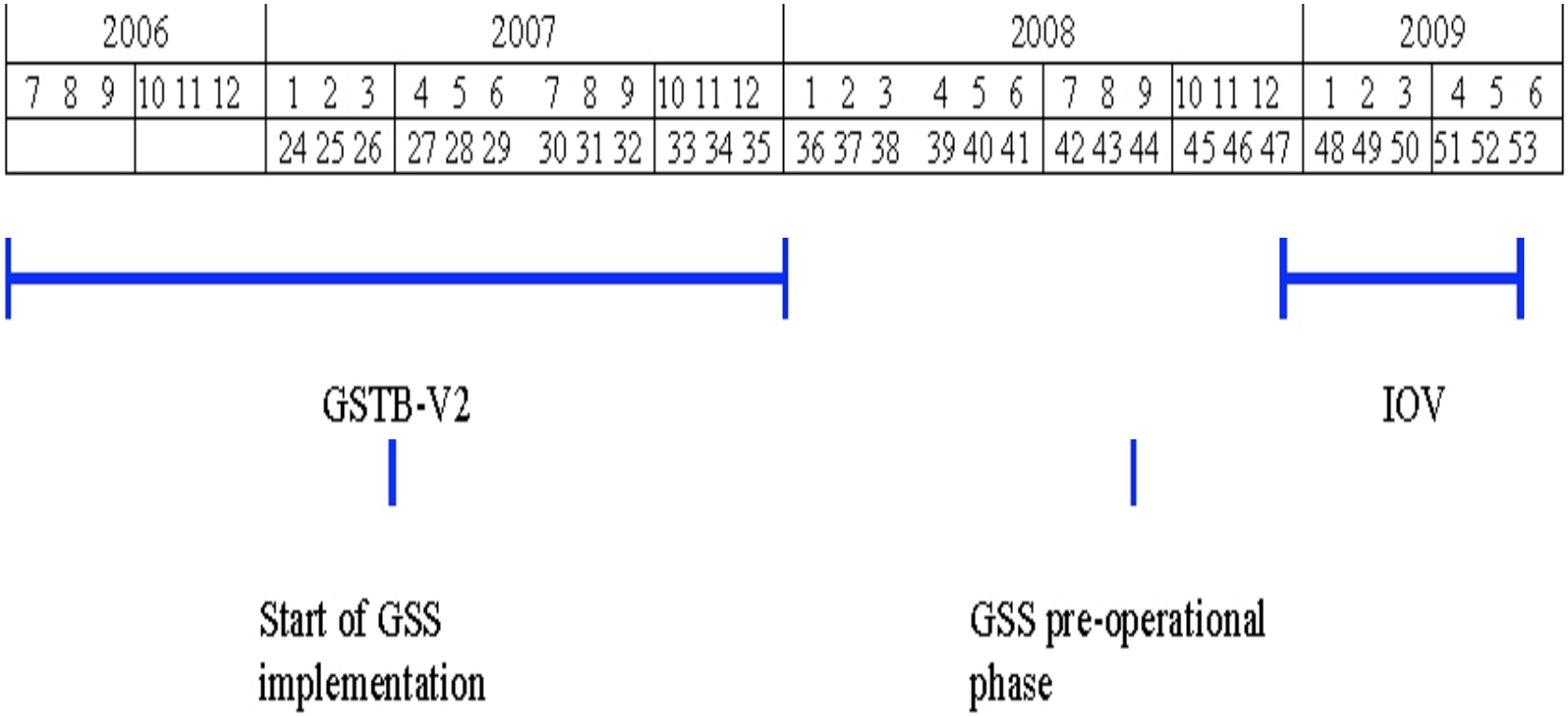


GGSP Products



- http://ggsp.gfz-potsdam.de **(preliminary)**
- http://www.ggsp.eu **(submitted)**

GGSP Schedule



- **T_1: CDE phase 1 Kick-Off (December 2004)**

Summary

- GGSP Prototype consortium is a team of experts in the fields of GNSS, analysis and reference frames
- GGSP will initialize and maintain the Galileo Terrestrial Reference Frame
- GGSP will establish a prototype of a service with products for potential users
- Use of Galileo data of GSS at an early stage no finally decided

Thank you for your attention!