SCIGAL

Earth Science Applications using GALILEO

Status and Opportunities

SCIGAL
= Expression of Interest

- Submitted to EU by EUREF on June 2002 EoI are basis for future Calls for Proposals
- Provisional consortium : 35 institutes, compagnies and SME's
- EU received 63 EoIs for Galileo

SCIGAL - Basic Idea

- Establish operational European GNSS infrastructure exploring full potential of GALILEO
- Science-driven GNSS network serving high precision users
  - Geodesy, Geophysics, Meteorology, Timing, Navigation

Work to be done

- Technical development and testing : GALILEO/GPS tracking equipment and tools designed for scientific applications
- Infrastructure : GPS+GALILEO tracking network
- Research : scientific modelling taking advantage of GALILEO observations in addition to GPS observations
- Distribution : up-to-date high precision GNSS services, products and tools

One Galileo-related call in FP6
Sub-priority : Global Change and Ecosystems

- July 3rd, 2003 (180 M€) – deadline 0ct. 9, 2003
- VI.1.a) One Earth Systems Observation NoE (? M€) :

  "Contribution to the integrated development of terrestrial, marine, and atmospheric forecasting systems, including systems for climate research. Implementation of integrated multi-platform systems, data quality, resolution and spatial coverage, including the capacity of the systems to adapt to technological progress over the medium and long term.

- Not a "Galileo-specific" call

Exceeds SCIGAL, more linked to EPISTAGE (global) and IGGOS (C. Reigber)

Galileo Joint Undertaking

- Management of Galileo research & development activities (contract with EU 100M€)
- Operational as of Sept. 1st, 2003
- Call for proposals issued on July 31, 2003
  - Deadline mid October 2003
  - Contracts signed mid December 2003

Galileo-specific Funding

- 1097M€, jointly financed by EU (5M€50) and ESA (547M€),
- 100M€ for Galileo Joint Undertaking
  - 1st Galileo specific call of 31 July 2003 (20M€)
    - Deadline October 17, 2003
  - 2st Galileo specific call in 2004 (50M€)
  - 3rd Galileo specific call in 2005 (30M€)
- 997M€ for ESA to implement the GalileoSat Programme
  - 237 M€ for ESA itself
  - 760 M€ for industry

1st call of Galileo JU

- Issued July 31, 2003
- Deadline Oct. 17, 2003

Activity	Description	Budget	Funding	Duration	# Projects
A	User Receiver Preliminary Development	3.8 M€	100 %	24 m.	1
B	Galileo Local Component Development	3.8 M€	100 %	18-24 m	1
C	Introduction of Galileo Local Services using EGNOS	4.7 M€	50 %	24 m.	2-3
D	Application Market Development	1.7 M€	100 %	24 m.	1
E	Mission Implementation	4.9 M€	100 %	18-24 m	1

- A, B, D, E = Call for Tenders (precise deliverables)
- C = Call for Participation

Activity A
User Receiver Preliminary Development

General Goal:

Stimulate the European industry to make available as soon as possible prototype Galileo receivers, even before the Galileo signal is available.

This will allow to a quick development of all applications.

Activity A
User Receiver Preliminary Development
This call for Tender

- Create development plan for receiver and user terminal
- Develop Software Receiver (development tool)
- Start developments of
  - Core technologies necessary to develop GPS/Galileo receiver
  - Parts of receiver prototype (simulating hardware parts)
  - Validation tools to test the receiver before availability of Galileo signal

Activity B
Galileo Local Component Development

General Goal:

Ensure that the Galileo Local Services will be available to as many users as possible, in as short time frame as possible.

Simultaneously with the Galileo Global Services and operational from scratch (≠ GPS).

Activity B
Galileo Local Component Development
This Call for Tender

- Develop core technologies (building blocks based on FP5 study 'Galilei') what's new within Galileo
  - e.g. T-CAR RTK algorithms, Interference detection modules, transmission protocols, …
- Update the 'Local Elements infrastructure development and implementation plan', taking into account
  - GPS evolution
  - Existing infrastrucures
  - ….

Activity C
Introduction of Galileo Local Services using EGNOS

General Goal:

Development and implementation of Pilot Projects aiming at the development of the EGNOS/Galileo market.

Emphasize what makes EGNOS/Galileo different from other augmentation and navigation signals.

Activity C
Introduction of Galileo Services using EGNOS
This Call for Participation

- Pilot Project that best demonstrates EGNOS (Galileo) added-value wrt present GPS
- Deliver
  - system design documentation
  - Business case
  - Development, implementation and exploitation plan
- Perform service prototype test campaigns
- Involve end users and their associates
- Dissimination and promotion of results

Activity D
Application Market Development

General Goal:

Demonstrate the market potential of EGNOS and Galileo, targeting EGNOS as being the forerunner of Galileo, through demonstration projects

Provide independent market information in support of the concession process

Activity D
Application Market Development
This Call for Tender

- Definition of an application, service plan, market analysis and development of business case
- Set up small-size demonstration project
  - focussing on extension of the service (Eastern Europe, Mediteranean, Africa)
  - Directly involving the end-user
- awareness activities ('small-size project, but the world will need to know about it')
- Training activities (e-learning)

Activity E
Mission Implementation

General Goal:

Increase the attractiveness of Galileo to the user communities and prepare the introduction of the Galileo Services by interfacing with external bodies.

Cluster of self-standing topics : standardization, frequency allocation, certification

Activity E
Mission Implementation
This Call for Tender

- Develop standards for Galileo and EGNOS
  - Signal in Space
  - receivers (aviation, maritime, road, rail, …)
- Consolidate Galileo mission by refining
  - Service definition, interfaces with external entities, …
- Protect Frequency allocation and support frequency coordination
- Refine Galileo certification framework combined with GPS/Galileo augmentation services

SCIGAL wrt present calls ?

- Activity A (receivers)
  - Receivers is just small part of SCIGAL
  - SCIGAL partners should take initiative themselves
- Activity B (local components)
  - Request for 1 project covering ALL (9) Galileo Local Services, but SCIGAL = 'High precision on-demand or broadcast RTK services'
- Activity C (EGNOS)
  - No clear role for SCIGAL at this stage

SCIGAL wrt present calls ?

- Activity D (Application market development)
  - Presently very concentrated on market analysis and business cases
- Activity E (Mission Implementation)
  - Need for representatives in relevant standardization bodies

Application types covered by Galileo Local Elements

1. Network assisted positioning

   Centralised server computes position using raw data from subscriber

   Location based service for pedestrian, emergency caller position for mobile telephone users

2. Indoor positioning

   New-level of positioning used in daily life (seats in theatre)

3. Location based service

   Subscribers terminal computes its position using the assistance data sent by the server

   Route guidance and emergency call service for car based users

Application types covered by Galileo Local Elements

4. High precision broadcast RTK
   reference stations, 1000 km coverage, central processing, uplink GNSS data to satellite
   oil and gas industry – dm accuracy

5. High precision on-demand services
   reference stations, VRS data streams
   land and cadaster surveys - < dm accuracy

6. Rail
7. Aviation
8. Maritime
9. Road

http://www.epncb.oma.be/SCIGAL