

Opportunities on Galileo in SEA

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Training in GNSS

AIT, Bangkok, 14-18 January 2019



European
Global Navigation
Satellite Systems
Agency

HORIZON 2020

bavAIRia

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NSTDA

NSL

IFEN



Background



- SEA is one of the most dynamic areas of the world
- SEA is not a GNSS provider
- Challenging natural environment with multi-GNSS and scintillations
- GNSS applications are considered key for SEA countries' sustainable growth

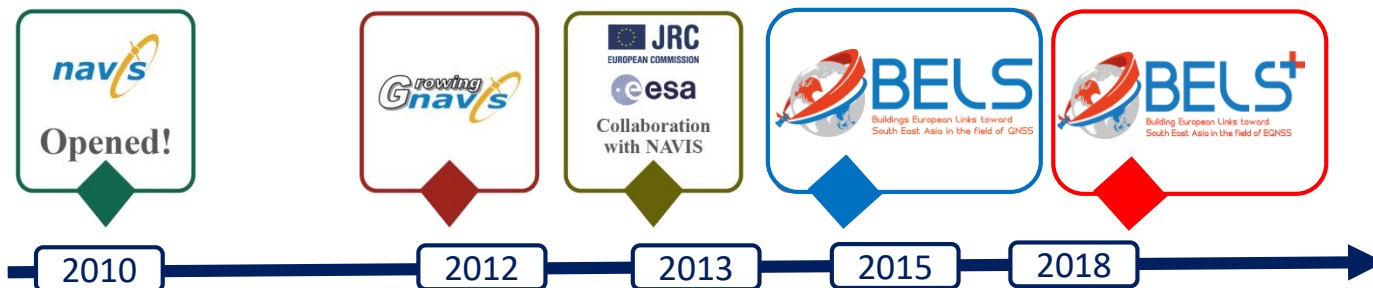


EU-Asia Collaboration in GNSS

- 2005 – 2007 JEAGAL Project: *Train-the-trainer action on GNSS*
- 2009 – 2010: FP7 SEAGAL Project: *Setup of the NAVIS Centre*

October 1st, 2010: Navis Centre opening!

- 2012 – 2015: FP7 Growing NAVIS Project
- 2015 – 2018: H2020 BELS Project
- 2018 – 2020: H2020 BELS plus Project



navis International Collaboration Centre for R&D on Satellite Navigation Technology in South East Asia



“The mission of Navis is to boost the R&D of satellite navigation technology, especially the European Galileo System, in South-East Asia.”

<http://navis.hust.edu.vn>

Recognition from international organizations



**COUNCIL OF
THE EUROPEAN UNION**



51. The Ministers welcomed the setting-up of a co-operation framework in the field of civilian use of satellite navigation systems, and expressed their willingness to promote the involvement of their relevant institutions and organisations. They encouraged in particular the establishment of a permanent EU-ASEAN collaboration centre on civilian use of satellite navigation systems.

**18th ASEAN-EU Ministerial Meeting Co-Chair's Statement
Madrid, 26 May 2010**

The 18th ASEAN-EU Ministerial Meeting, under the theme of "Partners in Regional Integration", was held in Madrid, Spain on 26 May 2010 and co-chaired by their



**UNITED NATIONS
Office for Outer Space Affairs**



**International Committee on
Global Navigation Satellite Systems**

**9th ICG Meeting
Prague, 13 November 2014**

Working Group: Information Dissemination and Capacity Building

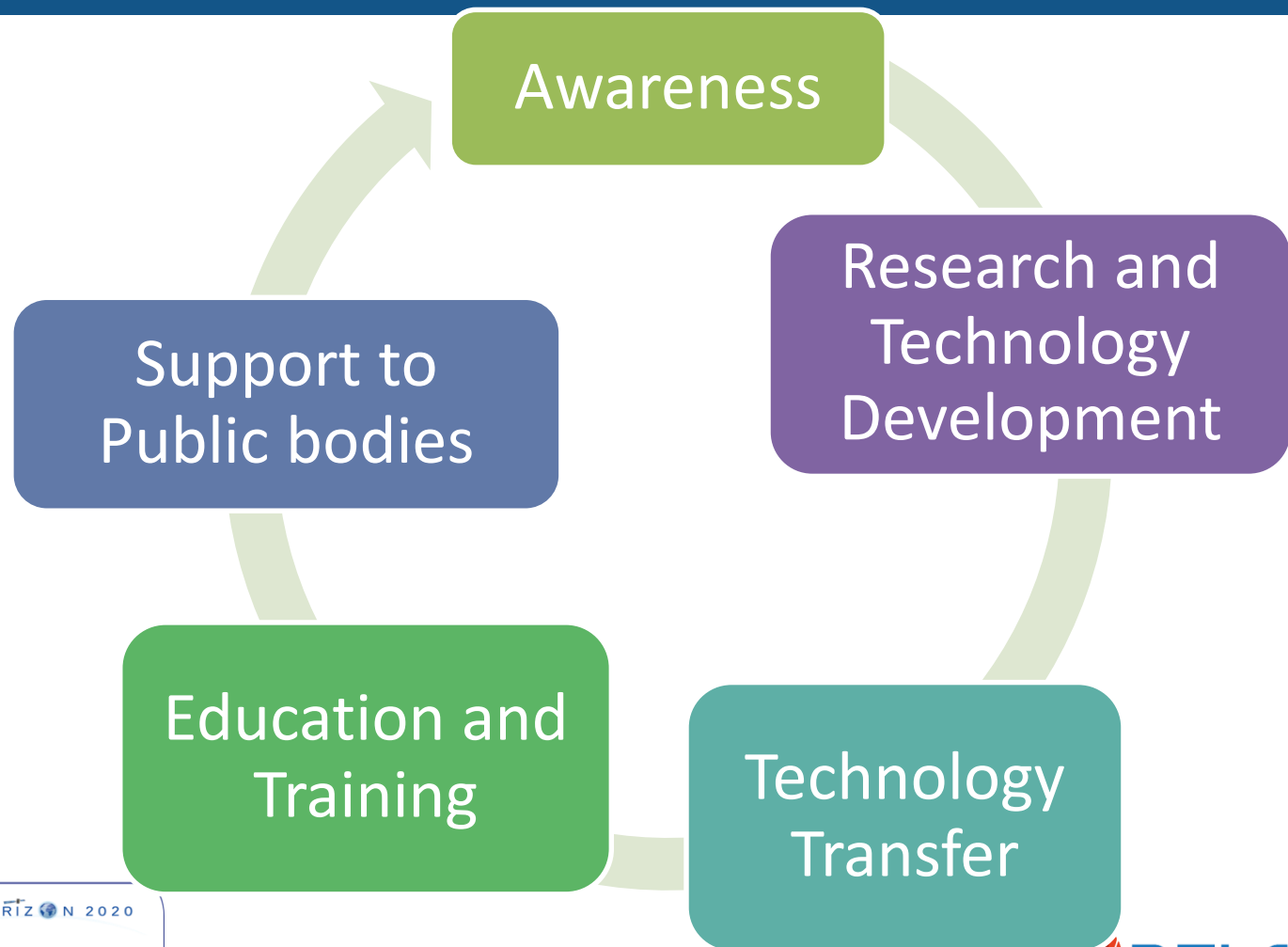
Recommendation of Committee Action:

ICG Working Group C recommends that the Office for Outer Space Affairs in cooperation with the ICG membership, and the educational centres and organizations, such as the NAVIS Centre and GEospatial and Space Technology consortium for Innovative Social Services (GESTISS), and international initiatives, such as MGA and its members, organize workshops and technical seminars in the field of GNSS and its applications in South East Asia region. The participation of BeiDou/GNSS Application Demonstration and Experience Campaign (BADEC) is also encouraged.



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NAVIS Services

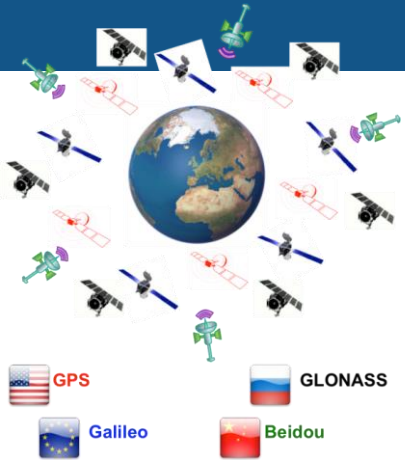


International Cooperation in RTD

- With European institutions:
 - Universities: Polito, UPC, UFC, ENAC...
 - Organization/Institution: JRC, ESA, ISMB, INGV, BavAIRia ...
- With Japanese institutions:
 - JAXA, universities...
- With Australian institutions:
 - University of New South Wales (UNSW)...
- Cooperation with ASEAN Member States:
 - via bi-lateral, multi-lateral projects, and regional organizations such as SCOSA, MGA...
- Member of Multi-GNSS Asia (MGA)



Research Topics



1. Multi-GNSS signal processing and receiver design
2. Precise positioning technologies (DGNSS/RTK/PPP)

3. Resilient GNSS:

- Ionospheric scintillation & monitoring
- Interference mitigation
- GPS anti-spoofing and anti-jamming

4. Intelligent Transport System (ITS) and Location-Based Services (LBS)

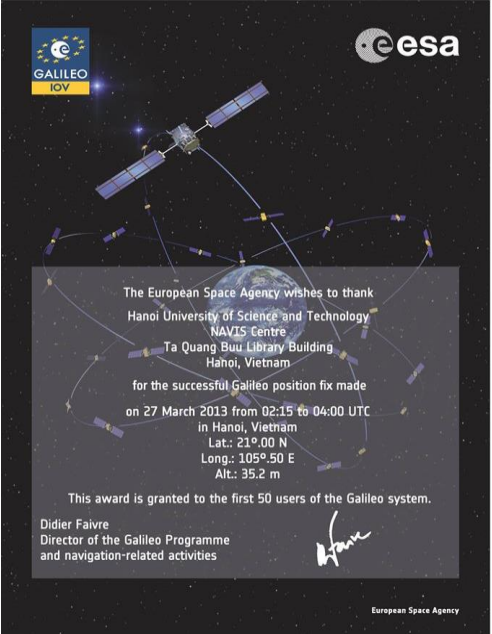


Some R&D Results

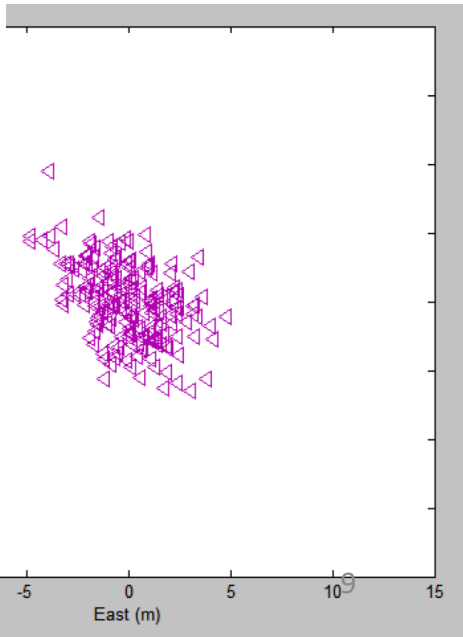
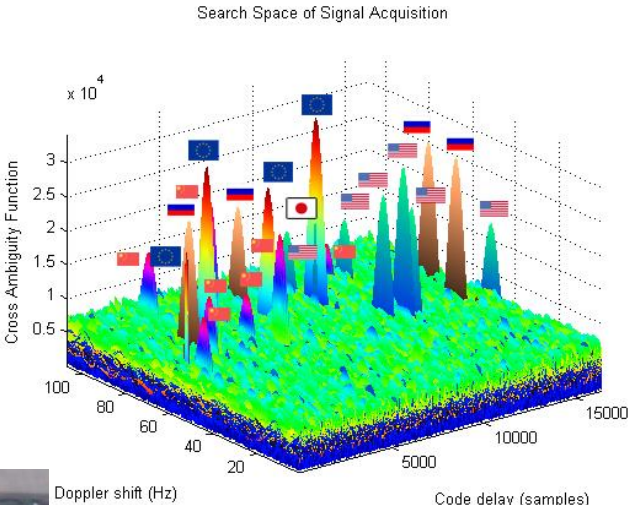
Multi-GNSS software receiver and signal processing

**GPS/GLONASS/Galileo/Beidou/QZSS
multi-system solutions**

Among 50 first users
of the Galileo system

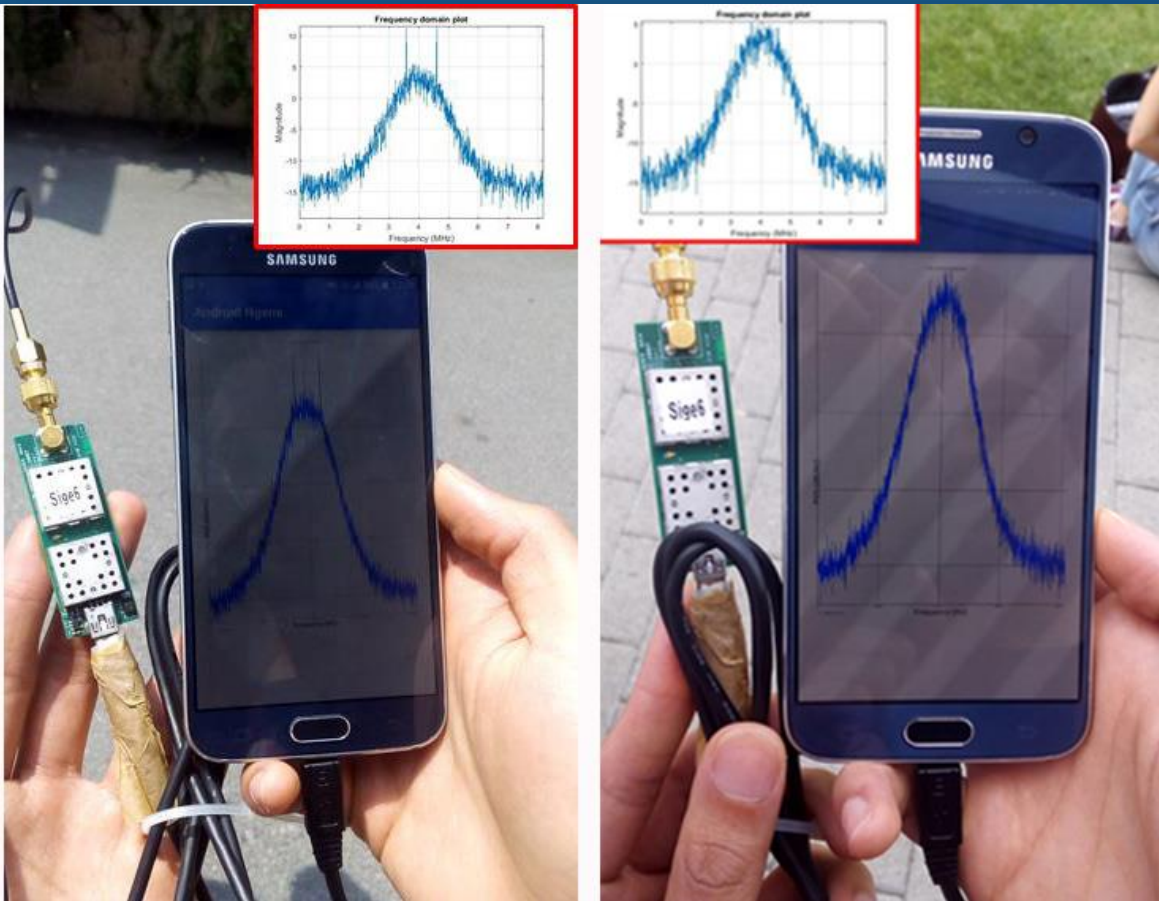


The European Space Agency wishes to thank Hanoi University of Science and Technology NAVIS Centre, Ta Quang Bui Library Building, Hanoi, Vietnam, for the successful Galileo position fix made on 27 March 2013 from 02:15 to 04:00 UTC in Hanoi, Vietnam. Lat.: 21° 00' N, Long.: 105° 50' E, Alt.: 35.2 m. This award is granted to the first 50 users of the Galileo system. Didier Faivre, Director of the Galileo Programme and navigation-related activities.



Some R&D Results

Portable Interference Detector



Open sky conditions:
interference caught

20

Western portion of the sky
obscured by a nearby
building: **no interference**

M. Boella
I S M B
Istituto Superiore Mario Boella



**NGeneApp of
NAVSAS on Mobile
Phone**



Training and awareness raising

- Organisation of international training courses, summer schools, and workshops for students and technicians from public and private sector in Vietnam and in the Asia-Pacific.



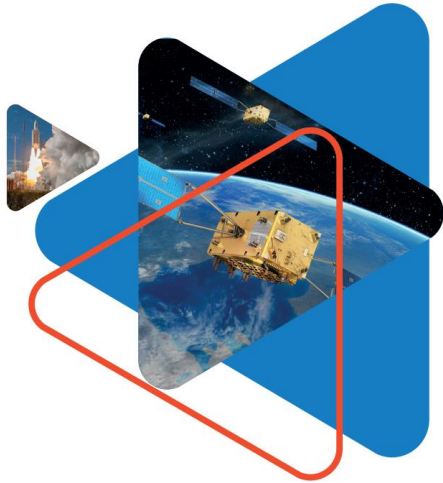
- Institutional teaching of HUST where NAVIS staff lecture, final projects for graduate and undergraduate HIST students.
- PhD students



Bangkok, 14-19 January 2019



BELS+ Objectives



- To facilitate the breakthrough of **EGNSS technology** in South East Asia through the support to EU Companies to establish links and bring their EGNSS solutions to SEA
- To conduct a set of coordinated **activities for awareness raising and capacity building** to extend and strengthen the links between SEA and EU
- To exploit the potentialities of the **NAVIS Centre** in Hanoi consolidating the results achieved in past years and maximizing the outcomes

BELS+ Target groups



Main target groups of these activities are:

- European companies, professionals and institutions which are expected to benefit from BELS+ actions.
- **SEA professionals and stakeholders** ensuring a proper sharing of benefits between the regions.

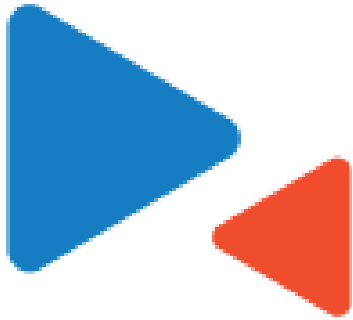


BELS+ Actions

The Galileo Demo Centre @ NAVIS



BELS+ Actions



- Establish training for professionals and graduate students
 - **1 Training Day @ FIG Conference Hanoi, 21 April 2019**
- Organize an event on European GNSS technology at a conference in Asia
 - **Special Session on Galileo @ FIG Conference Hanoi, 22-26 April 2019**
- Facilitate participation of an Asian people at a relevant event/conference in Europe
 - **Call for travel support to participate in Munich Navigation Summit 2019**
- Promote the NAVIS Centre and its Demo facility – 2 events in SEA
 - **June/July 2019 Indonesia**



What BELS+ offers to SEA stakeholders



Find the right EU business partners

Establish new business relations to European companies

Get to know European GNSS applications at the GNSS Demo Centre in Hanoi



Explore the full capabilities and excellence Galileo solutions

Find the appropriate Galileo Solution for your purpose



Participate in the Galileo Trainings in the EU and SEA



Partnership

Research & Technology Transfer
Centres / Cluster

Universities

Companies



Logos for the European Global Navigation Satellite Systems Agency, HORIZON 2020, bavAIRia, I S M B, NSTDA, NSL, IFEN, ANavS, and SPACEARTH TECHNOLOGY.



Thank you for your attention!

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