ICG-13

"Interoperability – 2030"
Project
Implementation and poll results
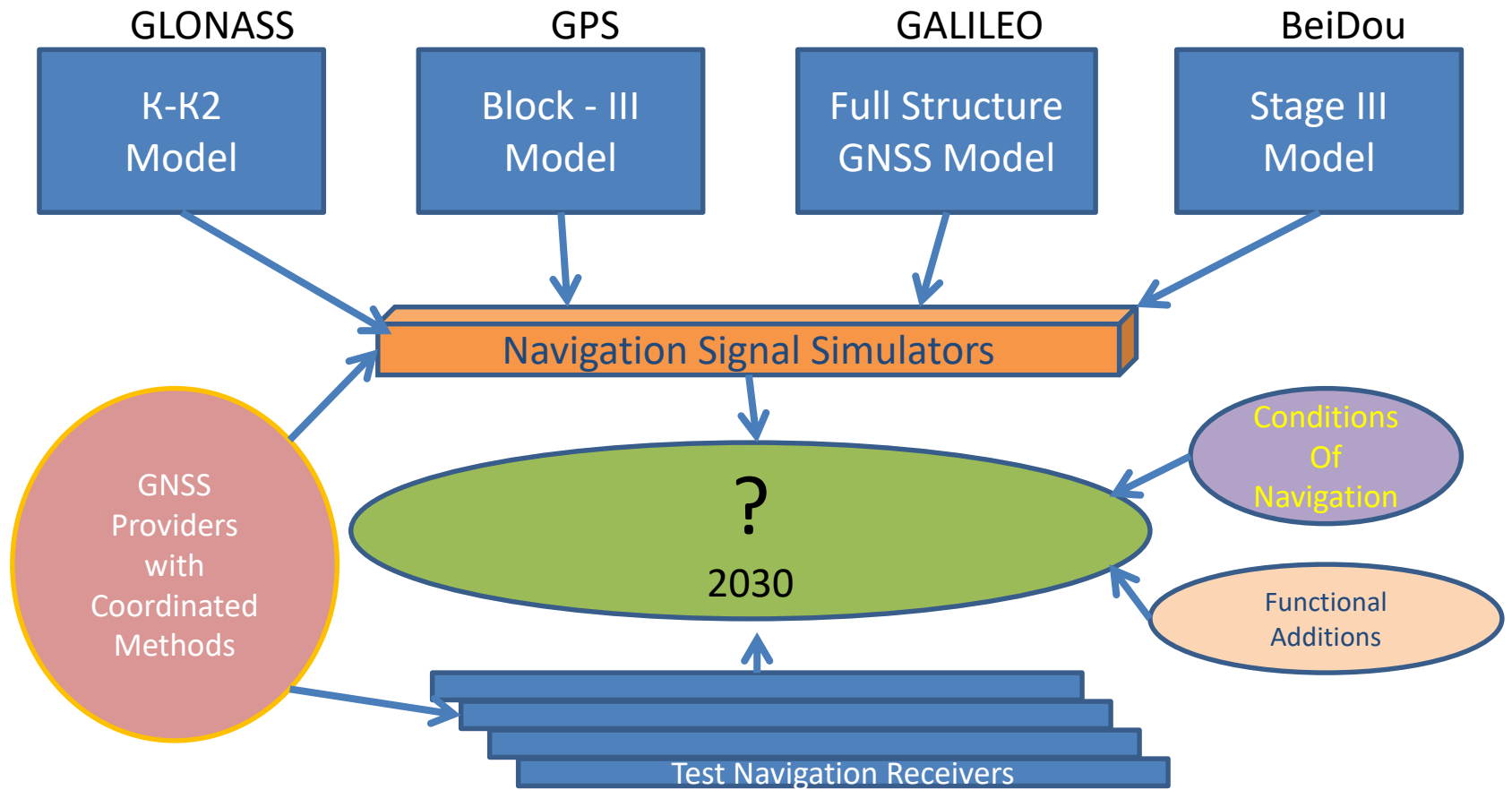
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Xi'an, China

S. Silin
A. Muravyev

«Interoperability-2030» Project

On 12th ICG Meeting in Kyoto (Japan) in December 2017 and Intersessional ICG working group S meeting in Vienna (Austria) in June 2018 Russian delegation suggested to start «Interoperability-2030» Project Poll.

«Interoperability-2030» Project

GLONASS

К-К2
Model

GPS

Block - III
Model

GALILEO

Full Structure
GNSS Model

BeiDou

Stage III
Model

Navigation Signal Simulators

GNSS
Providers
with
Coordinated
Methods

?

2030

Conditions
Of
Navigation

Functional
Additions

Test Navigation Receivers

Poll carrying out

The purpose of poll is to organize collecting and analysis of basic data for forecasts and calculations of navigation receivers characteristics for the purpose of formation coordinated program and techniques for control of these characteristics and also their simulating model that can make a basis for creation for system of GNSS interoperability characteristics monitoring.

To the meeting participants and also all interested parties it was offered to answer the following questions:

Poll Questions

1. Whether there is a need for ensuring development of the standard on the model receiver to organize implementation of the action program, for example, the "Interoperability - 2030" project?

2. Whether it is necessary to choose the unique operating mode for the receiver – stationary?

3. Whether it is necessary to choose several characteristic operating modes for the receiver:

   stationary;

   the rectilinear movement with acceleration;

   circle movement;

   the movement in the conditions of shadings and re-reflections;

   other conditions (what?)

4. Whether it is necessary to plan only simulating tests or to provide along with them also tests on real signals?

5. Whether have to be presented in the considered standard on the receiver along with characteristics as well techniques for tests?

6. Whether it is necessary to add in addition to already used parameters of interoperability the new private parameters $I_{ij} = rms_{ij} / rms_{\Sigma}$?

   If yes, are they will be operational or not operational parameters?

7. Whether the special service of monitoring and assessment of GNSS prospects for compliance of interoperability characteristics to standard requirements to quality of signals taking into account requirements to the model receiver has to be organized?

Working Group S Poll

Working group S Co-chairs agreed with need of holding similar poll and promised to distribute the list of questions among the group participants, members of the Committee and other interested persons for the purpose of receiving feedback from the international community.

At the time of holding the 13th ICG meeting at Xian (China) in November, 2018 answers to questions are not received yet.

Russian Poll

The Russian side has in parallel started the similar poll among the Russian enterprises regarding obtaining remarks and offers on a subject of the «Interoperability-2030» Project.

12 enterprises, the organizations and educational institutions from Moscow, St. Petersburg and other Russian cities participated in the poll.

We suggest to your attention the preliminary data obtained as a result of the poll.

Russian Poll (2)

Question 1. Whether there is a need for ensuring development of the standard on the model receiver to organize implementation of the actions program, for example, the «Interoperability-2030» Project?

Reply: Most of the poll participants have supported the idea of development of the standard on the model receiver. For ensuring unity of the measurements taken by the GNSS various providers, respondents believe expedient to use the uniform standard on the model receiver which development will require the actions program within the *«Interoperability-2030»* Project.

It is noted that the model receiver has to have the stable and reproduced characteristics. For the different purposes in quality of model receivers the equipment of various types, generally high-precision and precision, for example, a geodetic class, can be used. In the long term model receivers have to be based on completely digital receivers with quantization of an entrance signal directly at the bearing frequency, i.e. at the antenna output.

Russian Poll (2)

Question 2. Whether it is necessary to choose the unique operating mode of the receiver – stationary?

Reply: It is necessary to choose several operating modes: stationary and non-stationary.

Question 3. Whether it is necessary to choose several characteristic of the receiver operating modes :

stationary;

the rectilinear movement with acceleration;

circle movement;

the movement in the conditions of shadings and re-reflections;

other conditions (what?)

Reply: All respondents have agreed with this offer. Other working conditions aren't offered yet.

Russian Poll (3)

Question 4. Whether it is necessary to plan only simulating tests or to provide along with them also tests on real signals?

Reply: For providing assessment of real quality of the radiated signals of GNSS it is expedient to provide along with simulating tests also tests on real signals.

Question 5. Whether have to be presented in the considered standard on the receiver along with characteristics as well techniques of tests?

Reply: For ensuring unity of measurements and also ensuring transparency of the taken measurements according to this standard, it is expedient to include techniques of carrying out tests in the considered standard.

Russian Poll (4)

Question 6. Whether it is necessary to add to already used interoperability parameters the new private parameters

$$I_{ij} = rms_{ij} / rms_{\Sigma},?$$

If yes, are they will be operational or not operational parameters?

Reply: It is expedient to use private interoperability indicators as operational parameters since it will allow to estimate a contribution of each GNSS at assessment of interoperability indicators that can be almost significant when comparing various GNSS among themselves.

Russian Poll (5)

Question 7. Whether the special service of monitoring and assessment of GNSS prospects for compliance of interoperability characteristics to standard requirements to signals quality taking into account requirements to the model receiver has to be organized?

Reply: Respondents have stated interest in the organization of the specified service at the national and international levels. For this purpose it is offered to modernize the existing monitoring services.

Summary

The received preliminary poll results show interest of the Russian producers of the navigation equipment of consumers, users of services of the global navigation satellite systems, research institutes, educational institutions and other organizations in holding actions of the «Interoperability-2030» Project.

At the same time the idea of creation and use for tests of the model navigation receiver for the purpose of confirmation of interoperability characteristics and parameters for various GNSS is confirmed.

Summary (2)

For assessment and obtaining comparable test results have to be carried out with use of various characteristic for the receiver operating modes, both in the simulating mode, and in an operating mode on real signals. Along with the existing general criteria for evaluation of interoperability of various GNSS private indicators can be used as quick.

Techniques of carrying out tests have to be included in the developed standard.

Assessment of GNSS prospects for compliance of interoperability characteristics to standard requirements to quality of signals taking into account requirements to the model receiver can be executed by the existing services of monitoring of the GNSS parameters.

Conclusion

Considering the received preliminary results, once again it would be desirable to appeal to the Working group S Co-chairs to distribute the list of questions among Group participants, Committee members the and other interested persons for the purpose of receiving feedback from the international community.

Poll results can help with development of the recommendation for the International Committee on GNSS on making decision on start for the «Interoperability-2030» Project.

Thank You for Attention!