COMBINED INERTIAL NAVIGATION SYSTEM (INS+GPS)

RPE HARTRON-ARKOS, Ukraine
Perspectives of launch services market development

European current family of launcher

Guidelines of European launcher family development

1. Guarantee of European space access until 2025.
2. Launch service cost reduction with the functionality keeping.
3. Existing launchers performances extension by its modernization.

Problems of the launch services market:

1. Launch services high price.
2. Saturation of the market by the different types of launchers and therefore high competitiveness.

Ways to achieve the claimed goals:

1. Design of new kinds of propulsions.
3. GNC modernization (implementation of new approaches and conceptions)
Launcher’s GNC Modernization using Combined Inertial Navigation System

GNC modernization

GNC Software optimization

The usage of the Combined Inertial Navigation System based on INS and GPS will allow to increase the accuracy of navigation parameters determination considerably.

GNC Hardware modernization

Combined Inertial Navigation System concept

Advantages:

1. Considerable accuracy increasing of navigation parameters determination and, therefore, increasing of the whole GNC performances.

2. Decreasing of the accuracy requirements of the main INS, which allows to use more cheaper components.

3. Possibility of the European navigation system “Galileo” usage.
短纲要 / 提案概念

目标：

提案的目标是将现有的惯性导航系统（INS）与全球定位系统（GPS）结合，以提高发射器的导航精度。项目的产品将是导航算法软件包和硬件单元。我们知道，在欧洲这个问题尚未解决，因为欧洲的发射器仅使用惯性导航系统。

影响：

如果项目实施，欧洲发射器的导航系统精度将得到改善。同时，它将能够使用欧洲的卫星导航系统“伽利略”在商业应用中使用。
Short introduction into the state-of-the-art

Nowadays all known launchers use high accuracy INS, based on technology of strap-down INS. These systems are quite expensive and at once they do not solve the task of minimization of instrumental errors completely. Therefore this problem continues to be urgent now.

Scientific / technological aims of the project exceeding the state-of-the-art

**Business aim** of the project is reducing the cost of navigation system using by the European launchers. It could be reached by using more cheaper INS together with GPS navigation for the best accuracy. Another aim is usage of the European satellite navigation system “Galileo” in the commercial application.

**Scientific aim** of the project is synthesis of combined inertial navigation system, which could be implemented for any types of launchers.

**Technological aim** is developing technology of combined inertial navigation system design.
FP7 Consortium

FP7 CONSORTIUM

LEADING COMPANY

RPE HARTRON-ARKOS (Ukraine)

ELV S.p.a. (Italy)
CONTACTS

Oleksandr Lukyanovych
Leading scientist

Research Production Enterprise HARTRON-ARKOS LTD
Address: Academika Proskury str. 1, Kharkov, 61070 Ukraine
E-mail: sash74@mail.ru
Phone: +38 057 719 47 79 (office)
       +38 067 957 04 28 (mobile)
Fax:   +38 057 315 43 49