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АТТЫ WCET-2012 V-ШІ БҮКІЛӘЛЕМДІК ИНЖИНИРИНГ
ЖӘНЕ ТЕХНОЛОГИЯ КОНГРЕСІНІҢ

ТЕЗИСТЕР ЖИНАҒЫ

1 - 2 маусым, 2012, Алматы

СБОРНИК ТЕЗИСОВ

V ВСЕМИРНОГО КОНГРЕССА ИНЖИНИРИНГА
И ТЕХНОЛОГИЙ – WCET-2012
«НАУКА И ТЕХНОЛОГИИ: ШАГ В БУДУЩЕЕ»

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ffiser U-bend used in a turbogenerator cooling system, a hydraulic-turbine draft tube, and an a steam turbine [4]. Computations were performed on the base of the Reynolds-Averaged RANS) equations supplemented by one or another two-equation turbulence model.

eric case of a U-bend, experimental study of pressure losses in an original form duct and in a CFD- was performed that confirmed a dramatic gain due to optimization. However, there was a consider- etween the measured and predicted absolute pressure losses. This difference was even more (up to ctical case of the U-bend. It points that more advanced turbulence models like Large Eddy Simula- NS/LES hybridization should be used at the next step of such an activity.

g the problem of the draft tube shape optimization, it was stated that, apart from discretization ifics of a particular turbulence model, the flow structure and engineering quantities predicted e both to the inlet distributions of mean velocity components and to values prescribed at the r transported turbulence quantities. A straight way to overcome this issue is to simulate the whole rotor/stator configuration including stay vanes, guide vanes, a runner and a draft tube. f time and resource consuming computations prevents introducing CFD optimization into ctice.

CFD-based optimization of steam turbine exhaust hoods are the most optimistic despite the is very complicated. It turns that due to a relatively high level of turbulence and pressure optimized shape case, neither turbulence model nor inlet turbulence level play a very sig- e optimization output.

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ТАЦИОННОЕ МОДЕЛИРОВАНИЕ РАБОТЫ ДАТЧИКА ГОРИЗОНТА

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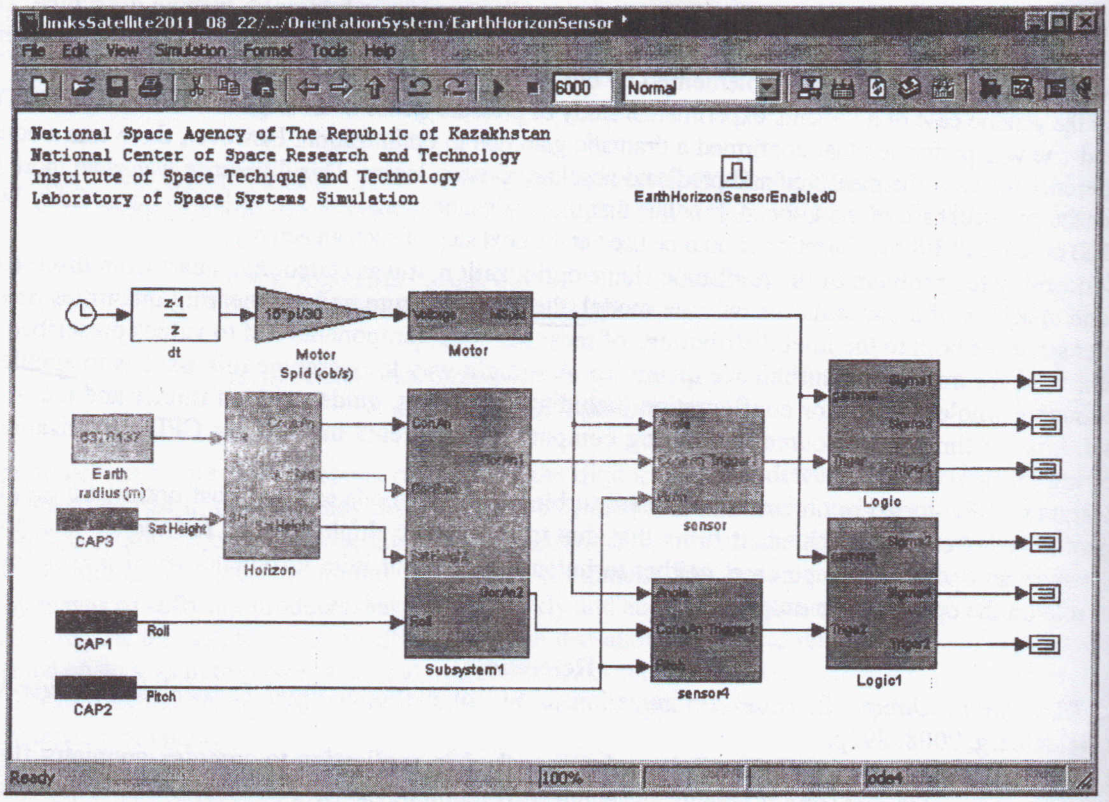
ли или других небесных тел для определения местной вертикали используются дат- , которые являются одними из основных датчиков, входящих в состав контрольно- аппаратуры системы ориентации космического аппарата. Датчики горизонта пред- инфракрасные датчики, принцип работы которых основан на измерении изменения границе космического пространства (примерно 4°К, что соответствует -269°С) и дис- оло 260°К для Земли), являющегося источником излучения инфракрасной энергии. туры отмечается, когда сканирующая ось датчика пересекает линию горизонта [1], ность определить линию горизонта небесного тела и местный вертикаль.

имитационная модель работы датчика горизонта с коническим сканирующим лучом м среды моделирования MathWorks MatLab/Simulink, программная реализация кото- рисунке 1.



National Space Agency of The Republic of Kazakhstan
National Center of Space Research and Technology
Institute of Space Techique and Technology
Laboratory of Space Systems Simulation

Рис. 1. Simulink-диаграмма имитационной модели «Датчик горизонта»

В работе приведены результаты моделирования датчика при определении горизонта Земли.

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SIMULATION MODELING OF THE HORIZON SENSOR

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Horizon sensor which is one of the main sensors of the measuring equipment of a spacecraft is used for determining of the local vertical near the Earth or other celestial bodies. Horizon sensors are the infrared sensors and its principle of operation is based on measuring of changes in temperature at the boundary of space (about 4 ° K, which corresponds to -269 ° C) and the disk of the planet (about 260 ° K for the Earth), which is the source of the radiation of infrared energy. The jump in temperature is noted when the scanning axis of the sensor crosses the horizon [1] and it makes possible to determine the horizon of a celestial body and the local vertical.

Simulation model of operation of horizon sensor with the cone scanning beam was developed with help of MathWorks MatLab/Simulink and its realization is showed at the figure 1.