

Abstract for the „International Space Forum–2001: Peaceful space and the future of mankind“,  
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### **Sensorimotor coordination during and after simulated microgravity**

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#### **Abstract**

Results previously obtained in Dry water immersion (DWI) experiments suggest that proprioception is seriously disrupted when subjects are exposed to extended periods of sensory deprivation. In DWI experiments a water-filled pool is covered with a thin foil on which the subject is lying in supine position as motion less as possible. The aim of this study was to examine the proprioceptive function under this simulated microgravity condition. It was supposed that in an arm matching test the incomplete representation of the arm due to degraded proprioceptive feedback will cause errors in matching the arms.

Experiments were performed with four healthy volunteers (age ranged from 24 –30 years) pre-, during (12 hrs, 24 hrs, 36 hrs) and post-immersion (48 hrs, 49 hrs). ZEBRIS CMS-50, an ultrasonic distance measuring system, recorded the absolute coordinates of the moved arms (setting arm, matching arm). Every 12 hours in DWI the subject was blindfolded and got in touch with a platform which was lifted. Immediately the setting arm was passively and slowly moved by the experimenter into one of three arm positions (45°, 90°, 135°).

The radial error represents the absolute deviation of the matched arm from the position of the setting arm in the moment of matching. It was shown that matchings in-immersion and post-immersion are more variable than those pre-immersion, especially in position 135°. The Radial Error depended significantly on position and phase (pre-, in-, post-immersion) but not on subject or setting arm. The Radial Error was significantly largest in post-immersion phase. Thus a simple task which is used in neurological examination and which can be performed correctly without difficulty under normal conditions, was impaired as soon as important information is lacking.

МЕЖДУНАРОДНЫЙ КОСМИЧЕСКИЙ ФОРУМ – 2001

## “Мирный космос и будущее человечества“

ПОСВЯЩЕННЫЙ 40-ЛЕТИЮ ПОЛЕТА Ю.А. ГАГАРИНА

11 - 13 апреля 2001 года

Москва, Россия



12 апреля 2001 г. исполняется 40 лет со дня первого в истории полета человека в космос. Полет Ю.А. Гагарина открыл эру освоения космического пространства, послужил катализатором быстрого развития научно-технического прогресса, современных технологий, фундаментальной и прикладной науки. Пилотируемая космо-навтика прошла путь от полета корабля “Восток” до создания уникальной междуна-родной космической станции.

Результаты космической деятельности вошли в повсе-дневную жизнь: науку и технику, медицину, биологию, связь, геологию и метеороло-гию, информатику, образование – в этих и во многих других областях космонавтика играет значительную роль. 11-13 апреля 2001 г. в Москве состоится Международный форум “Мирный космос и будущее человечества посвященный 40-летию первого полета человека в космос.

Цель форума – анализ современного состояния и перспектив развития мировой космической науки и техники в XXI в. и поиск путей более широкого использования ее достижений на благо человечества. В работе форума примут участие представители национальных космических агентств, ведущих научно-исследовательских центров и промышленных фирм, крупнейших университетов и учебных центров, российских и зарубежных коммерческих организаций, страховых компаний и банков.

**International Space Forum – 2001**

## “Peaceful space and the future of mankind”

**in Commemoration of the Fortieth Anniversary of Yu. A. Gagarin's Flight**

**April 11-13, 2001**

**Moscow, Russia**

April 12, 2001 marks 40 years since the day of the first ever manned flight into space. The flight of Yu.A. Gagarin opened the era of space exploration, served as a catalyst for the rapid development of scientific and technological progress, modern technologies, fundamental and applied science. The manned space flight came a long way from the flight of the Vostok spacecraft to the creation of a unique international space station.

The results of space activity entered everyday life: science and technology, medicine, biology, communications, geology and meteorology, computer science, education — cosmonautics plays a significant role in these and many other areas. The International Forum “Peaceful Cosmos and the Future of Mankind” dedicated to the 40th anniversary of the first manned flight into space

The purpose of the forum is to analyze the current state and prospects for the development of world space science and technology in the 21st century. and finding ways to make greater use of the achievements for the benefit of mankind. Representatives of national space agencies, leading research centers and industrial firms, major universities and training centers, Russian and foreign commercial organizations, insurance companies and banks will participate in the forum.