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FIRST RESULTS FROM THE GERMAN-RUSSIAN ICARUS SYSTEM FOR ANIMAL TRACKING FROM ISS

Abstract

What if you could use an Earth observations sensor that evolved over millennia? What new insights about our ecosphere could be made? How could those save human lives around the globe? The German-Russian ICARUS (International Cooperation for Animal Research Using Space) system is planning to do exactly that. It intends to utilize the natural senses of all kind of animal species on the entire globe as a new kind of Earth observation sensor. By learning more about the lives of these animals – How they migrate. How they react to natural disasters. – the scientists involved in ICARUS hope to gain new knowledge about our environment and how it changes. ICARUS is a cooperation between the German Aerospace Center (DLR) and Roscosmos. Scientists from the Max Planck Institute of Ornithology in Germany and the Institute of Geography of the Russian Academy of Science are leading this project. The space segment of ICARUS consists of a large antenna that was installed outside the Russian segment of the International Space Station (ISS) in August 2018. The ground segment consists of small radio transmitter and sensor units called tags that will be attached to the respective animal. Their small size and mass, about 25 x 15 x 5 millimeters and 5 grams, will allow the fixation to small animals like singing birds without altering their natural behavior. The tags record data about the movements of its host and its environment. It sends its data to the ISS antenna once the ISS passes over the subject. An On-Board Computer inside the station will decode the received data and will relay it to the Russian Mission Control Center in Moscow. The ISS project is a first test of the ICARUS technology. It will help to determine its performance and reliability. It will also deliver first scientific data from the area that is covered by the ISS low earth orbit. Commissioning of the system was completed in the first half of 2019. This paper will give an overview of the history of the project, its current status, its first results and its potential.