

Engineering Test Satellite VIII (ETS-VIII) “KIKU No. 8” Project

Fishing buoy (Tosakuroshio Ranch No. 16, Kochi Prefecture)

— We talk with YAMAMOTO Shinichi, Senior Researcher of Space Communication Systems Laboratory, Wireless Network Research Institute, about experiments using ETS-VIII.

ETS-VIII (Engineering Test Satellite VIII (ETS-VIII) “KIKU No. 8”) was launched in December 2006. In outer space, we deployed two large antennas for transmission and reception, both close to the size of a tennis court at 19m long and 17m wide—the world’s largest communications satellite.

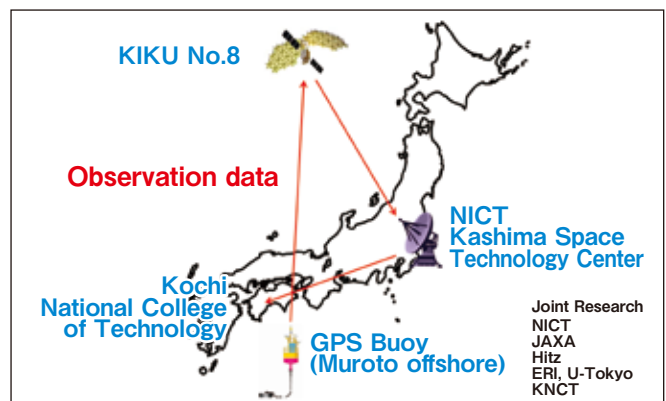
—Please share your recent experiment results.

In 2012, we conducted a data transmission experiment from a marine buoy as a satellite sensor network experiment aimed at the early detection of tsunamis. We attached a small sensor earth station to a fishing buoy (8m diameter) floating approximately 40km off of Murotomisaki, Kochi Prefecture, transmitted wave information using “KIKU No. 8”—which was received at Kashima Space Technology Center—and conducted an experiment where we send received data in real time to related institutions through terrestrial lines. This experiment was conducted in collaboration with Kochi National College of Technology, Earthquake Research Institute of the University of Tokyo, Hitachi Zosen Corporation, JAXA, and NICT. The marine buoy is tossed around by waves and moves non-stop. Using an antenna system which track a satellite automatically was difficult because the amount of power we can use with the buoy is limited, so in the experiment, we needed to use an omnidirectional antenna. Although the transmission power was 0.8 watts and information speed 50bps, we were able to sufficiently transmit wave information.

—How will you utilize the experiment results?

Based on this experiment, we were able to get a fundamental data for data transmission from the marine buoy including many amount of knowledge. Today, people are worried that a tsunami will occur from a large earthquake centered in the Tonankai trough. Although we hope for data from more than 100km

offshore for tsunami observation, it is hoped that the early detection of the tsunami is enabled without having the distance from the coast by using satellite communications. Also, we can transmit data from disaster areas to places far away and therefore can without fail send out received information. We use the results obtained this experiment for the early detection of disaster and for the systems design of an information collection, and also for the system operation.



Conceptual diagram of the experiment
(Image provided by: Kochi National College of Technology)



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