# University-side activities in a science educational project: in case of SSH consortium Kochi

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http://obs.ele.kochi-tech.ac.jp/HP/index.html

1. Introduction

Collaborating between high-schools (HS) and universities, a science educational program of 'SSH (Super Science High-schools) consortium Kochi' was established in 2006, in order to investigate sprites. Being financially supported by Japan Science and Technology Agency (JST), we have 29 attending HS with a host school of Kochi Ozu in high-school side. In university side, Kochi University of Technology (KUT) has been supporting the project with academic knowledge and technology. Participating students are continuously observing sprites by using high sensitivity CCD cameras with a motion detective software. The consortium has succeeded in sprite observations of 400 or more a year, for example, with a successful detection of simultaneous multi-sites observation of an ELF in February, 2008 (Sakamoto and Tokuhiro, 2008).

2. Image archiving system for the SSH consortium

Since each participating HS has their own observing images and movies, respectively, without having a combined database for archiving these observational data, establishing such a database on Internet is necessary for joint researches. Therefore, a database specialized in this program was built on a server at KUT (Omae and Yamamoto, 2008). The web site was designed as a kind of file management systems with functions of uploading images, generating links to the database, making image thumbnails, user authentication, automatic album construction, and sending a short-mail for inquiry uses. A test web site has already opened to participants since December, 2008. The system has been managed at KUT corresponding to user's requests, currently being under construction of a file search function for images simultaneously observed by multiple sites.

3. Optical and electromagnetic observation of sprites

A goal of the program at the first phase was to obtain simultaneous multi-sites observations. After that, now we are in consideration about a next plan: observations of electromagnetic waves in VLF˜ELF bands with optical observations of sprites. Electromagnetic observation has more advantage in obtaining precise timings of thunders and sprites than that of video frames. Using a part of orthographical loop antennae and pre-amplifier circuits, signals of electromagnetic waves can be recorded on a PC as sound files. Combining multi-sites observations, we can analyze wave patterns, their spectra, and source positions of electromagnetic waves generated by thunders and sprites. Since November 2008, a test VLF observation system has been constructed and tested in field, getting ready to be able to distribute copies to the participating HS in whole of Japan. If the 29 HS of the consortium began simultaneous observations, comparisons of radio sources to exact positions of optically-observed sprites as well as investigations of frequency characteristics and propagations of the electromagnetic waves would be expected to become their study themes. In this paper, activities in university side of the SSH consortium project will be discussed.

References:

Sakamoto, A., Tokuhiro, M., Observations of high-altitude lighting phenomena by the SSH consortium, JPGU2008 high-school student session, A001-P012, Chiba, in Japanese, 2008.

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