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Creating the vegetation and land-cover classification map by hyperspectral camera on-board helicopter

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1.Introduction

Disaster of Fukushima Daiichi nuclear plant brought about wide area radioactive contamination in March, 2011. The deposition of radioactive material emitted from the plants differ by tree species and geographical feature. Therefore, to grasp vegetation and geographical feature is important for making countermeasure against radiation contamination.

In the previous paper, we used video camera installed on the helicopter. We used hyperspectral camera for the second experiment, and the image was used to make vegetation-land cover map in Yamakiya district, one of planed evacuation area in Fukushima.

2.Method

Hyperspectral camera used is ”NH-7” made by EBA JAPAN CO.,LTD. The specification is as follows: Image resolution:1.3M pixels, Capture rate:7sec(1.3M pixels), Wavelength range:350nm-1100nm, Wavelength sampling interval:5nm, Digitization:10bits, Weight:750g. We mounted NH-7 in helicopter by using the special antivibration device.

The weather condition was windy at the flight day, however, we took the satisfactory hyperspectral images. It is because NH-7 has the advantages of ”Freely configurable measurement time and Sensitivity adjustment function”. We make the hyperspectral images around Yamakiya elementary school.

3.Results

We analyzed the hyperspectral data by using ”ENVI” image processing software. The classification is accurate in every element by comparing the image by video camera and field investigation.

4.Vision

We brought out what the vegetation and land-cover classification map based on hyperspectral data is available for understanding the situation of land utilization accurately and promptly.

In the future, we will create the method of analyzing in more broad area and short time by using the knowledge leaned in this time and try to create the vegetation and land-cover classification map in whole of Yamakiya area.

And we have the plan to capture without the influence of employment of airplane material because NH-7 is able to mount in UAV.

We will utilize the vegetation and land-cover classification map to make the efficient plan of decontamination.

Keywords: Hyperspectral Camera, Spectral imaging, Proximal Remote Sensing, Nuclear Disaster, Fukushima, Yamakiya