Japan Geoscience Union Meeting 2013
(May 19-24 2013 at Makuhari, Chiba, Japan)

G02-P01 Room:Convention Hall Time:May 19 18:15-19:30

Class room excercises using the JMA-59 type seismograph records.

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The JMA-59 type electromagnetic seismograph was a standard seismograph in Japan. We tried to develop some educational tools for earthquake study in mid to high-school class room using waveform data recorded by the JMA -59 type electromagnetic seismograph.

The main purposes of this tools are 1) reading features of wave records 2) measuring the S-P time 3) estimation of hypocentral distance with the Omori's distance formula 4)hypocebter determination using S-P times of surrounding several stations 5) calculation of magnitude using the Tsuboi's magnitude formula.

Advantages using the JMA-59 type wave records are 1) displacement records are easy to compare with real ground motion 2)the records drawn in ink are easy to realize an analog image of seismograph for students 3) 100 times amplitude and 1mm/sec time scale are easy to convert other scale.

We investigated and choose some seismograms for class room exercises among many wave records stocked in our library as following rules; 1) shallow earthquakes which are able to calculate magnitude using the Tsuboi's magnitude formula 2) wave records are not saturated 3) easy to read S-P time and maximum amplitude 4) easy to determinate hypocenter using these wave records.

In the conference, we will present our preliminary trial of this project.

Keywords: the JMA-59 type seismograph, seismograms, hypocenter determination, magnitude calculation, educational tool, class room exercise

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An attempt to develop a new teaching material for high school students observing sprites

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Sprites are one of the Transient Luminouos Events (TLEs) and are excited above a thunderstorm with strong positive flashes. The phenomena are observed all over the world and would be produced by the removal of large amount of positive charge from the thunderstorm (cloud-to-ground discharge). In Japan, sprites are observed by many high school students by means of high sensitivity CCD cameras. They have revealed the optical characteristics of sprites (e.g. morphology and 3-dimintional location). Although sprites are produced by the removal of charges from the thunderstorm, they do not have equipments to observe electrical phenomena causative of sprites. So, we developed a material in order to provide an observation method of sprite-producing thunderstorms and their electrical properties. The equipment is a low cost field mill data acquisition system observing the surface electric field change. If they can deploy more than four field mills in short distance at most 10 km, they can estimate an amount of positive charge removed associated with sprite-producing discharge under a simple assumption. We will present the observational and analytic concepts, and the developed low cost field mill data acquisition system.

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Keywords: teaching material, sprite, lightning, surface electiric field observation, estimation of charge removed by lighitnig