Observation and education in geoscience by using low-priced instruments

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In this presentation, we will introduce four experiments and hands-on activities for geoscience observing and measuring by using low-priced and small-sized commercial instruments. The Black Box for Environmental Measuring (BBEM) system is based on Arduino platform, low-power consumption sensors are employed to measure meteorological and environmental parameters. Built-in accelerometer on BBEM or smartphone could be used to observe shake and vibrations by earthquake and strong wind. Webcam is used to detect and record sprites, thunders, and the development of cumulonimbus, as well as automatically visibility observation. A simple VLF receiver is built by using the audio interface on computer, and the observed signals show the variations of the ionospheric D-region. These experiments are practical which have been applied in classroom and science outreach in Taiwan.

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