

**R010-24**

**B 会場 : 11/25 PM1 (13:45-15:45)**

**15:00~15:25:00**

## **デジタル画像記録方式ソーダボトル磁力計を用いた観測及びデータ処理教育**

#今城 峻<sup>1)</sup>

(<sup>1</sup> 京大地磁気センター

## **Education of Observation and Data Processing with a Digital Image-Recording Soda Bottle Magnetometer**

#Shun IMAJO<sup>1)</sup>

(<sup>1</sup> Graduate School of Science, Kyoto University

The soda bottle magnetometer, which is a handmade torsion-type magnetic variometer, has been used for space weather education in middle-to-high latitude regions. However, this teaching material is rarely used in magnetically low latitude regions such as Japan because manual reading of the light spot reflected from the mirror attached to the sensor magnet cannot resolve small magnetic field fluctuations. In order to use the soda bottle magnetometer for a class at Kyoto University, I combined it with a data recording system that uses a webcam to take regular images of the position of the light spot, called the "Digital Image-Recording Soda Bottle Magnetometer". The center positions of the light spot were accurately determined from the digital images using Python programs. The resolution of the magnetic declination is less than  $\sim 0.08$  arcmin (or  $\sim 0.7$  nT of east-west magnetic fields at Kyoto), which is about ten times better than the manual reading. The new type of soda bottle magnetometer successfully detected Sq variations, solar flare enhancements, substorm magnetic bays at Kyoto (GMLat $\sim 25$  degrees) with amplitude  $< 5$  nT, as well as strong magnetic fluctuations of geomagnetic storms. Since images of light spots are acquired as digital data, students can analyze the data themselves on their computers. The cost of the observing system is low (less than 10,000 yen, excluding the PC). The digital image recording soda bottle magnetometer has potential for use in space weather education not only in universities, but also in high schools and citizen science.