

A class room tool for demonstrating the striped magnetic anomaly across the mid-oceanic ridges

OKAMOTO, Yoshio^{1*} ; IMURA, Yuri²

¹Osaka-Kyoiku University, ²Tennoji High school attached to OKU

The striped magnetic anomalies over the mid-ocean ridges play an important role at the emergence of the plate tectonics from the classical continental drift theory. The so-called "The Tape-Recorder Model" developed by Vine and Mathews(1963) is essential to study this process in a high-school class room. However only text-based resources are used to study for this theme. The students do not learn the theory and development process with firm reality or motivation. In this regard, we developed an analog model showing this striped magnetic anomalies in our class room. The model consists of a thick foamed styrol plate and iron nails which have been magnetized using a permanent magnet. The plate is a mimic of ocean floor and covered partly with colored tapes symmetrically showing stripes. The normal magnetized nails and reversed nails are stuck on the grids of the plate symmetrically across the center respectively. The measurement is carried out on a acrylic transparent plate above the foamed styrol plate which symbolize sea surface and sea floor. A magnetic sensor (Gauss-meter) is transversed over the model slowly and the total magnetic strength are measured at real time showing a periodic change. So, the students can be experienced the measurement on the ship and can comprehend easily the meanings of this measurement and the relation with the mechanism of "The Tape-Recorder Model". The cost of Gauss-meter is high expensive, so we tried to use a smart-phone as an alternative and found that thier magnetic sensor and the free application are sufficient enough and quite useful for this type of measurement. At the conference, we will present an analysis of this model and make a demonstration of magnetic survey using our model.

Keywords: magnetic anomaly, stripe, ocean floor spreading, education, high school