[JJ] Evening Poster | G (General (Education and Outreach)) | General (Education and Outreach)

[G-05]Geoscience education from elementary school to university students

convener:Masatsune Hatakeyama(Seiko Gakuin High School)
Sun. May 20, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
We will provide and discuss various educational practices (teachings and procedures) for elementary, junior high school, high school and university students. We also welcome outreach reports for all grades. In addition, especially for liberal arts level geoscience education of undergraduate, we will consider the problems and future prospects of our current situation.

[G05-P02]An improved spring-block model for educational use and its analysis –Nanso Satomi “Hakkenzan” Model-

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Keywords:spring-block model, earthquakes, educational tool, G-R law, Kenzan

The first spring-block model for educational use which simulates statistic behavior of earthquakes (particularly, Gutenberg-Richter’s law) was kicked off by Kato (2011). Inspiring this model, we have been developing a couple of spring block models for school use showing statistic property of earthquakes. The previous model used iron blocks made by a band-saw and a milling machine, so it needs metal processing skills (Okamoto, 2015). In this regards, we develop a new spring-block model which can assemble and improve in a short time in a classroom. This model follows the previous one on the whole, the eight iron blocks are alternated by using “Kenzans” for Ikebana ceremony which are sold at one dollar shops. This choice made us easy to adjust the pulling forces of rubber-bands which are connected to the needles of “Kenzan”. Two “Kenzans” cover up each other and make one mass block. Each block is connected with four rubber-bands and lines up one dimensional. The driving force of the system is given by a surrounding wooden frame moving by hand. The model can be easily assembled in a couple of hours. The weight of the block is not heavy, so it is critical to use an appropriate floor material which can perform a good stick-slip behavior. A vinyl chloride sheet is the best choice for this purpose. In the analysis, we check the slipped blocks only numbers and their coordinates instead of the slip distances of each block, which are mainly calicurated in the original B-K model (Burridge &Knopoff, 1967) to obtain the total potential energy changes of whole system (it is equivalent with magnitudes of shocks). Our analysis using naked eyes to check the numbers of slipped blocks, seems to look like “cell-automaton simulations” and is appropriate for educational use. In our current study, we can reproduce a G-R law statistics of slipping blocks. A PC simulation model which simulates the analog model behavior is also developed. The details of the analysis of this model will be discussed in the presentation.