Your abstract submission has been received

Print this page

You have submitted the following abstract to 2015 GSA Annual Meeting in Baltimore, Maryland, USA (1-4 November 2015). Receipt of this notice does not guarantee that your submission was complete or free of errors.

INEXPENSIVE PHYSICAL MODEL OF ELASTIC DEFORMATION AROUND A STRIKE-SLIP FAULT

ABBUHL, Brittany M. and CRONIN, Vincent S., Geology Department, Baylor University, One Bear Place #97354, Waco, TX 76798-7354, Brittany_Abbuhl@baylor.edu

The use of physical models in structural geology courses is a widely employed strategy for active learning. Education research has demonstrated that effective active-learning strategies employed in science courses significantly increase student learning and decrease the incidence of failure (Freeman et al., 2014, PNAS).

The deforming medium in the physical models used to illustrate Earth structures is often dry/wet sand, wet clay, dry powder, or some layered combination of these. Physical models of strike-slip faults are commonly built upon rigid lower plates that are slid horizontally past one another along straight edges that parallel the direction of relative motion. As the lower plates are moved relative to each other, the deforming medium is sheared and produces various deformation effects on its upper surface that are of interest to students: en echelon cracks or folds, sags and pop-ups, and small faults that coalesce into a through-going fault.

Elastic deformation away from the principle fault trace has been described many times since it was noticed in the great San Francisco earthquake of 1906 (Reid, in Lawson, 1908). Elastic effects were reported in the M6 South Napa earthquake of 24 August 2014, documented by relative displacement of GPS stations before, during and after the main shock (Hammond et al., 2014, c/o http://geodesy.unr.edu), by progressive displacement of markers along the ground surface, and by various observations of deformation by residents of the Browns Valley community through which the West Napa fault passes.

We developed a small (~30 cm x 30 cm x 6 cm), inexpensive (<~$10) physical model to help students visualize elastic deformation adjacent to a strike-slip fault. The model is made of foamboard, open-cell foam rubber in 2.5 cm-thick sheets, and adhesives, and is usually topped by a deforming medium (sand, clay, powder). Frictional drag along a vertical fault through the foam causes elastic strain in the foam, decreasing over ~10 cm from the fault surface to the line along which the foam is adhered to the foamboard below. Given enough displacement of the foamboard at the base of the model, slip releases elastic strain in the foam and produces surface rupture and audible sound. Details of the model design and use are available via http://CroninProjects.org/Abbuhl/.

Abstract ID#: 265963
Password: 957199
Meeting: 2015 GSA Annual Meeting in Baltimore, Maryland, USA (1-4 November 2015)

Abstract Submission Fee: Paid (gsa-2015AM-1887-5179-8125-0725)

Presenting Author
Brittany M. Abbuhl
Baylor University
One Bear Place #97354
Geology Department
Waco, TX 76798-7354
Phone Number: 254 710 2174
Email: Brittany_Abbuhl@baylor.edu
Student? Y

Vincent S. Cronin
Baylor University
One Bear Place #97354
Geology Department
Waco, TX 76798-7354
Phone Number: (254) 710-2174
Fax Number: (254) 710-2673
Email: Vince_Cronin@baylor.edu

* Membership Number 1189230
Student? N

If necessary, you can make changes to your abstract submission until Tuesday, 11 August 2015.

- To access your submission in the future, use the direct link to your abstract submission from one of the automatic confirmation emails that were sent to you during the submission.
- *Or* point your browser to /gsa/reminder.cgi to have that URL mailed to you again. Your username/password are 265963/957199.

Any changes that you make will be reflected instantly in what is seen by the reviewers. You DO NOT need to go through all of the submission steps in order to change one thing. If you want to change the title, for example, just click "Title" in the abstract control panel and submit the new title.

When you have completed your submission, you may close this browser window.

Tell us what you think of the abstract submission process

Home Page