Geophysical Research Abstracts,
Vol. 11, EGU2009-3844, 2009
EGU General Assembly 2009

Online Geodynamics: interactive web-applications for graduate students in Earth Sciences

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In teaching geosciences classes it is essential to provide students with the possibility of having hands-on experiences, even if sometimes they happen to be only in the virtual world. In the portal created for the Computational Geodynamics Laboratory (http://www.geociencias.unam.mx/geodinamica), we present web-based applications, which will help students to manipulate and visualize not only data but also to understand concepts like mantle convection, plate reconstruction or plate deformation. The "Toolbox" option provides a set of state of the art applications (WebMap, WebPlates, WebFlexure, WebGravity, and WebConvec), in which logged-in users can run on-line various programs, without previous knowledge of advanced programming. WebPlates is used in Plate Tectonics classes, helping students to identify and familiarize themselves with various tectonic plates, different tectonic limits, hotspots, etc. WebFlexure is used to study the mechanical behavior of oceanic plates at trenches. WebConvec comes with four cases, analyzing the thermal and thermo-chemical convection in different conditions. In this way the students can be aware of how variation of various physical parameters can affect the modeling results. The "Models" section presents a collection of dynamic numerical models created in the Computational Geodynamics Laboratory. In this section, the logged-in user can visualize convection and deformation models, tectonic plate reconstructions, or geophysical field data, like geoid, gravity, etc. All these applications are actively used in the Geodynamics classes.