Geophysical Research Abstracts
Vol. 16, EGU2014-4723, 2014
EGU General Assembly 2014

Implementing Subduction Models in the New Mantle Convection Code Aspect

Katrina Arredondo (2) and Magali Billen (1)

(1) U. C. Davis, Earth & Planetary Science, United States (mibillen@ucdavis.edu), (2) U. C. Davis, Earth & Planetary Science, United States (karredondo@ucdavis.edu)

The geodynamic community has utilized various numerical modeling codes as scientific questions arise and computer processing power increases. Citcom, a widely used mantle convection code, has limitations and vulnerabilities such as temperature overshoots of hundreds or thousands degrees Kelvin (i.e. Kommu et al., 2013). Recently Aspect intended as a more powerful cousin, is in active development with additions such as Adaptable Mesh Refinement (AMR) and improved solvers (Kronbichler et al., 2012). The validity and ease of use of Aspect is important to its survival and role as a possible upgrade and replacement to Citcom. Development of publishable models illustrates the capacity of Aspect. We present work on the addition of non-linear solvers and stress-dependent rheology to Aspect. With a solid foundational knowledge of C++, these additions were easily added into Aspect and tested against CitcomS. Time-dependent subduction models akin to those in Billen and Hirth (2007) are built and compared in CitcomS and Aspect. Comparison with CitcomS assists in Aspect development and showcases its flexibility, usability and capabilities. References: Billen, M. I., and G. Hirth, 2007. Rheologic controls on slab dynamics. Geochemistry, Geophysics, Geosystems. Kommu, R., E. Heien, L. H. Kellogg, W. Bangerth, T. Heister, E. Studley, 2013. The Overshoot Phenomenon in Geodynamics Codes. American Geophysical Union Fall Meeting. M. Kronbichler, T. Heister, W. Bangerth, 2012, High Accuracy Mantle Convection Simulation through Modern Numerical Methods, Geophys. J. Int.