

Publication List
Peter E. van Keken

Journal publications

- Wilson, C., M. Spiegelman, and P.E. van Keken, TerraFERMA: the Transparent Finite Element Rapid Model Assembler for multi-physics problems in the Earth Sciences, in revision for *Geochemistry, Geophysics, Geosystems*
- M. Morishige and P.E. van Keken, Along-arc variation in the 3-D thermal structure around the junction between the Japan and Kurile arcs, *Geochemistry, Geophysics, Geosystems*, 15, 2225-2240, doi:10.1002/2014GC005394, 2014.
- Kimura, J.-I., J.B. Gill, T. Kunikiyo, I. Osaka, Y. Shimosioiri, M. Katakuse, S. Kakubuchi, T. Nagao, K. Furuyama, A. Kamei, H. Kawabata, J. Nakajima, P.E. van Keken, and R.J. Stern, Diverse magmatic effects of subducting a hot slab in SW Japan: results from forward modeling, *Geochemistry, Geophysics, Geosystems*, 15, doi:10.1002/2013GC005132, 2014.
- Wilson, C.R., M. Spiegelman, P.E. van Keken, and B.R. Hacker, Fluid flow in subduction zones: the role of solid rheology and compaction pressure, *Earth Planet. Sci. Lett.*, 401, 261-274, 2014.
- Bossmann, A.B, and P.E. van Keken, Dynamics of plumes in a compressible mantle: implications for phase boundary topography, *Physics of the Earth and Planetary Interiors*, 224, 21-31, 2013.
- Abers, G.A., J. Nakajima, P.E. van Keken, S. Kita, and B.R. Hacker, Thermal-petrological controls on the location of earthquakes within the subducting slab, *Earth and Planetary Science Letters*, volumes 369-370, 178-187, 2013.
- van Keken, P.E., A. Davaille and J. Vatteville, Dynamics of a laminar plume in a cavity: the influence of boundaries on the steady-state stem structure, *Geochemistry, Geophysics, Geosystems*, 14, 158-178, 2013. doi:10.1029/2012GC004383.
- Bengtson, A.K., and P.E. van Keken, Three-dimensional thermal structure of subduction zones: effects of obliquity and curvature, *Solid Earth*, 3, 365-373, 2012. doi:10.5194/se-3-365-2012.
- van Keken, P.E., S. Kita, and J. Nakajima, Thermal structure and intermediate-depth seismicity in the Tohoku-Hokkaido subduction systems, *Solid Earth*, 3, 355-364, 2012, doi:10.5194/se-3-355-2012.
- Barcheck, G., D.A. Wiens, P.E. van Keken, and B.R. Hacker, The Relationship of Intermediate- and Deep-Focus Seismicity to the Hydration and Dehydration of Subducting Slabs, *Earth and Planetary Science Letters*, 349-350, 66-79, 2012.
- Nelson, W., T. Furman, P.E. van Keken, S.B. Shirey, and B.B. Hanan, Os-Hf isotopic insight into mantle plume dynamics beneath the East African Rift System, *Chemical Geology*, 320-321, 66-79, 2012, doi:10.1016/j.chemgeo.2012.05.020.
- Turner, S., Caulfield, J., M. Turner, P.E. van Keken, R. Maury, M. Sandiford, and G. Prouteau, Recent contribution of both sediments and fluids to the mantle volatile budget, *Nature Geoscience*, 5, 50-54, 2012. doi:10.1038/ngeo1325.
- Styles, E., S.D.B. Goes, P.E. van Keken, J.R. Ritsema, and H.E. Smith, Synthetic images of dynamically predicted plumes and comparison with a global tomographic model, *Earth and Planetary Science Letters*, 311, 351-363, 2011.
- Hwang, Y.K., J. Ritsema, P.E. van Keken, S.D.B. Goes, and E. Styles, Wave front healing renders deep plumes seismically invisible, *Geophysical Journal International*, 187, 273-277, 2011.
- van Keken, P.E., B.R. Hacker, E.M. Syracuse, and G.A. Abers, Subduction Factor 4: Depth-dependent flux of H₂O in subduction zones worldwide, *Journal of Geophysical Research*, 116, B01401, 2011, doi:10.1029/2010JB007922.
- Syracuse, E.M., P.E. van Keken, and G.A. Abers, The global range of subduction zone thermal models, *Physics of the Earth and Planetary Interiors*, 183, 73-90, 2010.
- Kimura, J.I., A. Kent, M. Rowe, M. Katakuse, F. Nakano, B.R. Hacker, P.E. van Keken, H. Kawabata, and R. Stern, Origin of cross-chain geochemical variation in Quaternary lavas from northern Izu arc:

- quantitative mass balance approach using Arc Basalt Simulator version 3 to identify source and mantle wedge processes. *Geochemistry, Geophysics, Geosystems*, 11, Q10011, 2010, doi:10.1029/2010GC003050.
- E. Mittelstaedt, A. Davaille, P.E. van Keken, N. Gracias, and J. Escartin, A non-invasive method for measuring the velocity of diffuse hydrothermal flow by tracking moving refractive index anomalies, *Geochemistry, Geophysics, Geosystems*, 11, Q10005, 2010, doi: 10.1029/2010GC003227.
- King, S.D., C. Lee, P.E. van Keken, W. Leng, S. Zhong, E. Tan, E. Tosi, and M.C. Kameyama, A community benchmark for 2D Cartesian compressible convection in the Earth's mantle, *Geophysical Journal International*, 180, 73-87, 2010, doi: 10.1111/j.1365-246X.2009.04413.x.
- Vattemville, J., P.E. van Keken, A. Limare, and A. Davaille, Starting laminar plumes: comparison of laboratory and numerical modeling, *Geochemistry, Geophysics, Geosystems*, 10, Q12013, 2009, doi:10.1029/2009GC002739.
- Kimura, J.-I., B.R. Hacker, P.E. van Keken, H. Kawabata, and R.J. Stern, Arc Basalt Simulator (ABS) version 2, a simulation model for slab dehydration and fluid fluxed mantle melting for arc basalts: modeling scheme and application, *Geochemistry, Geophysics, Geosystems*, Q09004, 2009, doi:10.1029/2008GC002217.
- Van Keken, P.E., C. Currie, S.D. King, M.D. Behn, A. Cagnioncle, J. He, R.F. Katz, S.-C. Lin, E.M. Parmentier, M. Spiegelman, and K. Wang. A community benchmark for subduction zone modeling, *Physics of the Earth and Planetary Interiors*, 171, 187-197, 2008.
- Brandenburg, J.P., E.H. Hauri, P.E. van Keken, and C.J. Ballentine, A multiple-system study of the geochemical evolution of the mantle with force-balanced plates and thermochemical effects, *Earth and Planetary Science Letters*, 276, 1-13, 2008.
- Kneller, E.A., M. Long, and P.E. van Keken, Olivine fabric transitions and shear wave anisotropy in the Ryukyu subduction system, *Earth and Planetary Science Letters*, 268, 268-282, 2008.
- Rondenay, S., G.A. Abers, and P.E. van Keken, Seismic imaging of subduction zone metamorphism, *Geology*, 36, 275-278, 2008, doi:10.1130/G24112A.1.
- Kneller, E.A., and P.E. van Keken, The effects of three-dimensional geometry on deformation in the mantle wedge: implications for shear wave anisotropy, *Geochemistry, Geophysics, Geosystems*, 9, Q01003, 2008.
- Van Hunen, J., P.E. van Keken, A. Hynes, and G.F. Davies, Tectonics of the Early Earth: some geodynamic considerations, *GSA Special Paper 440 "When did plate tectonics begin on Planet Earth?"*, K.C. Condie and V. Pease (editors), 157-171, 2008.
- Kneller, E.A., and P.E. van Keken, Trench-parallel flow and seismic anisotropy in the Marianas and Andean subduction systems, *Nature*, 450, 1222-1225, 2007, doi:10.1038/nature06429.
- Brandenburg, J.P., and P.E. van Keken, Methods for thermochemical convection in the Earth's mantle with force-balanced plates, *Geochemistry, Geophysics, and Geosystems*, 8, Q11004, 2007.
- Brandenburg, J.P., and P.E. van Keken, Deep storage of oceanic crust in a vigorously convecting mantle, *Journal of Geophysical Research*, 112, B06403, doi:10.1029/2006JB004813, 2007.
- Kneller, E.A., P.E. van Keken, I. Katayama, and S.I. Karato, Stress, strain and B-type olivine fabric in the fore-arc mantle: sensitivity tests using high-resolution steady-state subduction zone models, *Journal of Geophysical Research*, 112, B04406, doi:10.1029/2006JB004544, 2007.
- Johnson, A.E., J. Leigh, P.J. Morin, and P.E. van Keken, GeoWall: stereoscopic visualization for geoscience research and education, *IEEE Computer Graphics and Applications*, 26 (Nov/Dec), 10-14, 2006.
- Lin, S.-C., and P.E. van Keken, Deformation, stirring and material transport in thermochemical plumes, *Geophysical Research Letters*, 33, L20306, doi:10.1029/2006GL027037, 2006.
- Lin, S.-C., and P.E. van Keken, Dynamics of thermochemical plumes: 2. Complexity of plumes structures and implications for the mapping of mantle plumes, *Geochemistry, Geophysics, Geosystems*, 7, Q03003, doi:10.1029/2005GC001072, 2006.

- Lin, S.-C., and P.E. van Keken, Dynamics of thermochemical plumes: 1. Plume formation and entrainment of a dense layer, *Geochemistry, Geophysics, Geosystems*, 7, Q02006, doi:10.1029/2005GC001071, 2006.
- Abers, G.A., P.E. van Keken, *E.A. Kneller*, A. Ferris, and J. Stachnik, The thermal structure of subduction zones constrained by seismic imaging: implications for slab dehydration and wedge flow, *Earth and Planetary Science Letters*, 241, 387-397, 2006.
- Kneller, E.A.*, P.E. van Keken, S. Karato and J. Park, B-type olivine fabric in the mantle wedge: insights from high-resolution non-Newtonian subduction zone models, *Earth and Planetary Science Letters*, 237, 781-797, 2005.
- Lin, S.-C., B.-Y. Kuo, L.-Y. Chiao, and P.E. van Keken, Thermal plume models and melt generation in East Africa: a dynamic modeling approach, *Earth and Planetary Science Letters*, 237, 175-192, 2005.
- Pollack, H.N., *J.E. Smerdon*, and P.E. van Keken, Variable seasonal coupling between air and ground temperatures: a simple representation in terms of subsurface thermal diffusivity, *Geophysical Research Letters*, 32, L15405, doi:10.1029/2005GL023869, 2005.
- Lin, S.-C., and P.E. van Keken, Multiple volcanic episodes of flood basalts caused by thermochemical mantle plumes, *Nature*, 436, 250-252, 2005. doi:10.1038/nature03697.
- Van Keken, P.E., and S.D. King, Thermal structure and dynamics of subduction zones: insights from observations and modeling, *Physics of the Earth and Planetary Interiors*, 149, 1-6, 2005.
- Peacock, S.M., P.E. van Keken, S.D. Holloway, B.R. Hacker, G. Abers, and R.L. Fergason, Thermal structure of the Costa Rica – Nicaragua subduction zone, *Physics of the Earth and Planetary Interiors*, 149, 187-200, 2005.
- Van Keken, P.E., The structure and dynamics of the mantle wedge, *Earth and Planetary Science Letters (Frontiers)*, 215, 323-338, 2003.
- McNamara, A.K.*, P.E. van Keken, and S. Karato, Development of finite strain in the convecting lower mantle and its implications for seismic anisotropy, *Journal of Geophysical Research*, 108 (B5), 2230, doi:10.1029/2002JB001970, 2003.
- Ballentine, C.J., P.E. van Keken, D. Porcelli, and E. Hauri, Numerical models, geochemistry and the zero paradox noble gas mantle, *Philosophical Transactions of the Royal Society of London*, A360, 2611-2631, 2002.
- Van Keken, P.E., *B. Kiefer* and S. Peacock, High resolution models of subduction zones: implications for mantle dehydration reactions and the transport of water into the deep mantle, *Geochemistry, Geophysics, Geosystems*, 3 (10), 1056, 2002.
- McNamara, A.K.*, P.E. van Keken, and S. Karato, Development of anisotropic structures in the Earth's lower mantle by solid-state convection, *Nature*, 416, 310-314, 2002.
- Van Keken, P.E., E.H. Hauri, and C.J. Ballentine, Mantle mixing: the generation, preservation, and destruction of mantle heterogeneity, *Annual Reviews of the Earth and Planetary Sciences*, 30, 493-525, 2002.
- Zegers, T.E., and P.E. van Keken, Middle Archean continent formation by crustal delamination, *Geology*, 29, 1083-1086, 2001.
- McNamara, A.K.*, S. Karato, and P.E. van Keken, Localization of dislocation creep in the lower mantle: implications for the origin of seismic anisotropy, *Earth and Planetary Science Letters*, 191, 85-99, 2001.
- Van Keken, P.E., C.J. Ballentine, and D. Porcelli, A dynamical investigation of the heat and helium imbalance, *Earth and Planetary Science Letters*, 188, 421-434, 2001.
- Van Keken, P.E., Cylindrical scaling for dynamical cooling models of the Earth, *Physics of the Earth and Planetary Interiors*, 124, 119-130, 2001.
- McNamara, A.K.*, and P.E. van Keken, Cooling of the Earth: a parameterized convection study of whole vs layered models, *Geophysics, Geochemistry, Geosystems*, 1, 1027, 2000, doi:10.1029/2000GC000045.
- Van Keken, P.E. and S. Zhong, Mixing in a 3D spherical model of present day mantle convection, *Earth and Planetary Science Letters*, 171, 533-547, 1999.

- Van Keken, P.E., and C.J. Ballentine, Dynamical models of mantle volatile evolution and the role of phase transitions and temperature-dependent rheology, *Journal of Geophysical Research*, 104, 7137-7151, 1999.
- Van Keken, P.E., and C.J. Ballentine, Whole-mantle versus layered mantle convection and the role of a high-viscosity lower mantle in terrestrial volatile evolution, *Earth and Planetary Science Letters*, 156, 19-32, 1998.
- Van Keken, P.E., S.D. King, H. Schmeling, U.R. Christensen, D. Neumeister, and M.P. Doin, A comparison of methods for the modeling of thermochemical convection, *Journal of Geophysical Research*, 102, 22,477-22,495, 1997.
- Van Keken, P.E., Evolution of starting mantle plumes: a comparison between numerical and laboratory models, *Earth and Planetary Science Letters*, 148, 1-11, 1997.
- Van Keken, P.E., S. Karato and D.A. Yuen, Rheological control of oceanic crust separation in the transition zone, *Geophysical Research Letters*, 23, 1821-1824, 1996.
- Van Keken, P.E. and C.W. Gable, The interaction of a plume with a rheological boundary: comparison between 2D and 3D models, *Journal of Geophysical Research*, 100, 20,291-20,302, 1995.
- Van Keken, P.E., and D.A. Yuen, Dynamical influences of high viscosity in the lower mantle induced by the steep melting curve of perovskite: effects of curvature and time-dependence, *Journal of Geophysical Research*, 100, 15,233-15,248, 1995.
- Van den Berg, A.P., D.A. Yuen and P.E. van Keken, Rheological transition in mantle convection with a composite temperature-dependent, non-Newtonian and Newtonian rheology, *Earth and Planetary Science Letters*, 129, 249-260, 1995.
- Van Keken, P.E., D.A. Yuen, and L.R. Petzold, DASPK: a new high order and adaptive time-integration technique with applications to mantle convection and strongly temperature- and pressure-dependent rheology, *Geophysical and Astrophysical Fluid Dynamics*, 80, 57-74, 1995.
- Van Keken, P.E., D.A. Yuen, and A.P. van den Berg, Implications for mantle dynamics from the high melting temperature of perovskite, *Science*, 264, 1437-1440, 1994.
- Vlaar, N.J., P.E. van Keken and A.P. van den Berg, Cooling of the Earth in the Archaean, *Earth and Planetary Science Letters*, 121, 1-18, 1994.
- Van Keken, P.E., C.J. Spiers, A.P. van den Berg, and E.J. Muzyert, The effective viscosity of rocksalt: implementation of steady state creep laws in numerical models of salt diapirism, *Tectonophysics*, 225, 457-476, 1993.
- Van den Berg, A.P., P.E. van Keken, and D.A. Yuen, The effects of a composite non-Newtonian and Newtonian rheology on mantle convection, *Geophysical Journal International*, 115, 62-78, 1993.
- Van Keken, P.E., D.A. Yuen, and A.P. van den Berg, The effects of shallow rheological boundaries in the upper mantle on inducing shorter time scales of diapiric flows, *Geophysical Research Letters*, 20, 1927-1930, 1993.
- Van Keken, P.E., D.A. Yuen, and A.P. van den Berg, Pulsating diapiric flows: consequences of vertical variations in mantle creep laws, *Earth and Planetary Science Letters*, 112, 179-194, 1992.
- Van den Berg, A.P., D.A. Yuen, and P.E. van Keken, Effects of depth variations on the formation of plates in mantle dynamics, *Geophysical Research Letters*, 18, 2197-2200, 1991.

Book chapters:

- Ballmer, M., P.E. van Keken, and G. Ito, Hotspots, flood basalts, and melting anomalies, *Treatise on Geophysics* (editor G. Schubert), Volume 7 "Mantle Dynamics" (editor D. Bercovici), 393-459, 2nd edition, Elsevier, Amsterdam, 2015.
- Van Keken, Mantle mixing: processes and modeling, 351-371, in: *Physics and Chemistry of the Earth's Deep Interior*, S. Karato (editor), 412 pp, ISBN 978-0-470-65914-1, Wiley-Blackwell, 2013.
- Van Keken, P.E., C.J. Ballentine, and E. Hauri, Convective mixing in the Earth's mantle, Volume 2 "Geochemistry of the mantle and core" (editor R. Carlson) of the *Treatise of Geochemistry* (editors K. Turekian and H. Holland), 2nd edition, Elsevier, 2013.

- Ito, G., and P.E. van Keken, Hotspots and melting anomalies, chapter contributed to Volume 7 “Mantle Dynamics” (editor D. Bercovici) of the Treatise on Geophysics (editor G. Schubert), Elsevier, 2007.
- Van Keken, P.E., C.J. Ballentine, and E. Hauri, Convective mixing in the Earth’s mantle, Chapter contributed to Volume 2 “Geochemistry of the mantle and core” (editor R.W. Carlson) of the Treatise of Geochemistry (editor K. Turekian and H. Holland), Elsevier, 2003.
- Yuen, D.A., O. Cadek, P.E. van Keken, D.M. Reuteler, H. Kyvalova, and B.A. Schroeder, Combined results from mineral physics, tomography and mantle convection in their implications on global geodynamics., In: “Seismic modeling of the Earth’s structure”, E. Boschi, G. Ekstrom, A. Morelli (Editors), pp. 463-505, 1996.

Editorials, News & Views etc.

- Labeyrie, L., V. Salters, J.A. Tarduno, and P. van Keken, G-cubed: a snapshot today and a look to the future, *Geochemistry, Geophysics, Geosystems*, 7, Q03005, 2005, doi:10.1029/2006GC001252.
- Plank, T., and P. van Keken, The ups and downs of sediments, *Nature Geoscience (News&Views)*, 1 (1), 17-18, 2008, doi:10.1038/ngeo.2007.68.
- Salters, V., J. Tarduno and P. van Keken, Advances to G^3 , *Eos Transactions of the American Geophysical Union*, 89, 532, 2008.

Books

- Van Keken, P.E., Numerical modeling of thermochemically driven fluid flow, applied to the Earth’s lithosphere and mantle. *Geologica Ultraiectina*, 107, University of Utrecht, The Netherlands, 1993 (ISBN 90-71577-61-9).