

## The grain size of the lower mantle

D. Dobson (1), M. Ammann (1), and P. Tackley (2)

(1) University College London, Earth Sciences, London, United Kingdom (d.dobson@ucl.ac.uk), (2) Institut für Geophysik,  
Departement Erdwissenschaften, ETH Zürich, Sonneggstrasse 5, 8092 Zürich, Switzerland.

We have combined literature grain growth-rate laws for the main mantle phases with geodynamical simulations of an Earth-like convecting system to predict the grain size of the mantle. The predicted grain size of olivine in the upper mantle agrees well with grain sizes of mantle xenoliths, with a mean diameter of 1.2 mm. The grain size of perovskite in the lower mantle is predicted to be fairly constant throughout, varying by a factor of 2, with a mean value of 19 mm. The constant grain size of lower-mantle perovskite means that grain size evolution can be neglected for most purposes but the very small grain size of the lower mantle means that grain boundaries might make a significant contribution to the behaviour of the bulk lower mantle.