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Short-term variations in South Atlantic spreading rates from kinematic and tomographic models

Lorenzo Colli (1), Hans-Peter Bunge (1), Andreas Fichtner (2), Maria Chiara Bianchi (1), Ingo Stotz (1,5), Mark Smethurst (3), Stuart Clark (4), and Giampiero Iaffaldano (6)

(1) Ludwig Maximilian University, Munich, Germany (colli@geophysik.uni-muenchen.de), (2) Utrecht University, Utrecht, The Netherlands, (3) University of Exeter, United Kingdom, (4) Simula research laboratories, Norway, (5) Universidad de Concepcion, Chile, (6) Australian National University, Australia

Kinematic models for the opening of the South Atlantic ocean predict strong variations in spreading rates over times of a few million years. These short-term variations require a substantial decoupling of the plate from the lower mantle, which in turn points to a low viscosity asthenosphere acting as a lubricating layer. With the aid of a high resolution tomographic model of the South Atlantic upper mantle, we are able to image the spatial extent of this low viscosity layer below the oceanic plate and to assess its significance in connection with the spreading history of the South Atlantic ocean.