



The future of Earth's oceans: consequences of subduction initiation in the Atlantic and implications for supercontinent formation

Joao Duarte (1), Wouter Schellart (1), Filipe Rosas (2,3)

(1) Monash University, School of Earth, Atmosphere and Environment, Melbourne, Australia (joao.duarte@monash.edu), (2) Instituto Dom Luiz, Campo Grande, Portugal, (3) Universidade de Lisboa, Faculdade de Ciências, Departamento de Geologia, Campo Grande, Lisboa, Portugal

Subduction initiation is a cornerstone in the edifice of plate tectonics. It marks the turning point of the Earth's Wilson cycles and ultimately the supercycles as well. In this work, we explore the consequences of subduction zone invasion in the Atlantic Ocean, following recent discoveries at the SW Iberia margin. We discuss a buoyancy argument based on the premise that oceanic lithosphere older than 200 Ma is unstable to support large basins, implying that it must be removed in subduction zones. As a consequence, we propose a new conceptual model in which both the Pacific and the Atlantic oceans close simultaneously, leading to the termination of the present Earth's supercycle and to the formation of a new supercontinent, which we name Aurica. Our new conceptual model also provides insights into supercontinent formation and destruction (supercycles) proposed for past geological times (e.g. Pangaea, Rodinia, Columbia, Kenorland).