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Geodynamic evolution of the SW Europe Variscides

António Ribeiro,¹ José Munhá,² Rui Dias,³ António Mateus,² Eurico Pereira,⁴ Luísa Ribeiro,⁵ Paulo Fonseca,¹ Alexandre Araújo,³ Tomás Oliveira,⁵ José Romão,⁵ Hélder Chaminé,⁶ Carlos Coke,⁷ and Jorge Pedro⁸

The early evolution of SW Europe Variscides started by opening of the Rheic ocean at 500 Ma, splitting Avalonia from Armorica/Iberia. Subduction on the SE side of Rheic generated the Paleotethys back-arc basin (430–390 Ma, splitting Armorica from Iberia), with development of Porto-Tomar-Ferreira do Alentejo (PTFA) dextral transform defining the boundary between continental Armorica and Finisterra microplate to the W. Obduction of Paleotethys was followed by Armorica/Iberia collision and emplacement of NW Iberian Allochthonous Units at 390–370 Ma, whereas toward the west of PTFA, there was antithetic ophiolite obduction (Beja-Acebuches and Rheic ophiolites plus Finisterra continental slices) on top of Ossa-Morena Zone, with simultaneous development of eclogites and orogenic magmatism under a flake–double wedge tectonic regime. Continued convergence (<370 Ma) proceeded by intracontinental deformation, with progressive tightening of the Ibero-Armorican Arc through dextral transpression on the Cantabrian Indentor, from Iberia to Armorica. The proposed model is discussed at the light of the driving mechanism of “soft plate tectonics.”

¹LATTEX and Departamento de Geologia, Faculdade de Ciências, Universidade de Lisboa, Lisbon, Portugal.

²Departamento de Geologia and Centro de Geologia, Faculdade de Ciências, Universidade de Lisboa, Lisbon, Portugal.

³Departamento de Geociências, Universidade de Évora and Centro de Geofísica, Évora, Portugal.

⁴Departamento de Geologia, Instituto Nacional de Engenharia, Tecnologia e Inovação, S. Mamede Infesta, Portugal.

⁵Departamento de Geologia, Instituto Nacional de Engenharia, Tecnologia e Inovação, Zambujal, Portugal.

⁶Departamento de Engenharia Geotécnica, Instituto Superior de Engenharia do Porto, Porto, Portugal

⁷Departamento de Geologia, Universidade de Trás-os-Montes e Alto Douro, Vila Real, Portugal.

⁸Departamento de Geociências and Centro de Geologia, Universidade de Évora, Faculdade de Ciências, Universidade de Lisboa, Évora, Portugal