



Plate interactions of Laurussia and Gondwana during the formation of Pangea- Constraints by U-Pb LA-SF-ICP-MS detrital zircon ages of Devonian and Early Carboniferous siliciclastics of the Rheinisches Schiefergebirge (Rhenohercynian zone, Central European Variscides)

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The Rhenohercynian zone of the Central European Variscides contains top-NW thrusted rock complexes in the area of the Hörre nappe. Further to the north, par-authochthonous volcano-sedimentary complexes of the Lahn and Dill-Eder synclines occur. In our paper, a representative data set of U-Pb LA-SF ICP-MS ages of 1228 detrital zircon grains of Devonian and Lower Carboniferous sandstones from both areas is presented. The data constrain the Middle to Upper Devonian and the Lower Carboniferous siliciclastic and volcano-sedimentary complexes of the Hörre nappe to be allochthonous. The cluster of U-Pb ages of detrital zircon grains point to a provenance of the debris from the Saxo-Thuringian zone and rock complexes of the Mid-German Crystalline zone, which were formerly related to the latter one. A long-distance top-NW directed transport of the nappe complex in the Hörre nappe is required by our new data set. The zircon populations derived from the Saxo-Thuringian zone are representative for a Gondwanan hinterland and characterised by age clusters of \sim 530-700 Ma, \sim 1.8-2.2 Ga, \sim 2.5-2.7 Ga, and \sim 3.0-3.4 Ga. In a palaeogeographic view, the Saxo-Thuringian zone formed during Devonian to Lower Carboniferous time at the southern margin of the Rheic Ocean. A Lower Devonian sandstone sample from the par-authochthonous Lahn-Dill-Eder syncline shows a provenance, which is representative for Laurussia. Most of that debris seems to be derived from Baltica and Avalonia, two important parts of Laurussia. U-Pb zircon ages cluster at \sim 400-450 Ma, 540-650 Ma, 1.0-1.2 Ga, \sim 1.4-1.5 Ga, \sim 1.7-2.2 Ga, and 2.3-2.9 Ga. In terms of a palaeogeographic relation, these samples represent a sedimentary unit which was deposited at the northern margin of the Rheic Ocean at the edge of Laurussia facing to the south. Our data set constrains a top-SE directed subduction of the oceanic crust of the Rheic Ocean during its final closure and the formation of supercontinent Pangea.