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Mesozoic zircons in Miocene ignimbrite from E-Iceland: a splinter of a continental crust?

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The oldest lava formations in eastern and western Iceland are approximately 13-15 Ma old but the temporal relationship between the abundant silicic central volcanoes is not well constrained. Mount Hvítserkur in E-Iceland is composed of a caldera-filling ignimbrite lying on a gentle sloping basaltic lava pile. It is cross-cut by basaltic feeder dykes many of which terminate in a pillow-lava breccia at the top. Zircons were separated from this ignimbrite and analyzed for U-Pb isotopes by LA-ICP-MS. In a set of 16 zircon crystals approximately 50 μm-wide zones were ablated with a 193 nm excimer laser coupled to a high resolution ICP-MS. Cathode-luminescence images expose inherited and zoned cores surrounded by complex rims with a single euhedral zircon displaying regular zoning similar to what is normally observed in Icelandic zircons. This singular zircon yields a 206Pb/238U age of 12.5 $\pm$ 0.8 Ma ($\pm$ 2 sigma) that corresponds to the age of the surrounding volcanic formations. However, the 15 remaining zircon crystals give generally (13/15) concordant U-Pb ages in the range of 126 $\pm$ 4 Ma to 242 $\pm$ 7 Ma. These Mesozoic zircon crystals are thus significantly older than the oldest Miocene rocks in Iceland. The violent eruption at the origin of the Hvítserkur ignimbrite most likely extracted ancient rocks containing these old zircons from depth and brought them to the surface as xenocrysts and xenoliths. Consequently, a continental crustal splinter exists beneath E-Iceland. It could be a part of the Jan Mayen ridge that is thought to extend south under the Iceland plateau and have formed as a thinned continental margin of the Greenland crustal-shield. This crustal fragment became isolated in the N-Atlantic when activity at the easterly lying Ægir Ridge ceased and further west the Kolbeinsey Ridge propagated north. The 130-240 Ma age range of the Hvítserkur´s zircons could therefore correspond to magmatic ac-

tivity during the crustal thinning phase of Pangaea. The presence of a light continental crust under E-Iceland provides explanations to numerous “Icelandic anomalies”, such as the inferred abnormally thick crust, gravity and seismic characteristics and Pb- isotope composition of Tertiary basalts.