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Evidence of volcanism and former rift axis within the southern extent of the Iceland-Faroe Ridge

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The Iceland-Faroe Ridge (IFR) is an elevated area between Iceland, the Faroe Islands, and the Hatton Bank with water depths from 300–1800 m. It is believed that the Iceland hotspot is responsible for the formation of the IFR. During the opening of the Northeast Atlantic, the Reykjanes mid-ocean ridge formed by interlinking with the Iceland hotspot. These processes created a complex wide volcanic breakup margin of volcanic rift zones or intraplate volcanism that brought magma to the surface. These processes resulted in the formation of morphologic features, as seen onshore in Iceland today, such as ridges, volcanic cones and lava flows that are a physical record of the plates being rifted and spread apart. Therefore, the IFR has been in development since the opening of the NE-Atlantic (<55 Ma), standing out as a prominent feature on bathymetric and geophysical datasets. Volcanic features such as craters, eruptive fissures, submerge lava boarders and volcanic ridges have been identified on the ridge in recent multibeam and sub-bottom profiler data from the southern part of the Iceland-Faroe Ridge acquired by Marine and Freshwater Research Institute (Iceland) and SHOM (France). With northeast-southwest trending structures, the most preserved features lies at around 1500-2000 m water depth in the southern slopes of the Iceland-Faroe Ridge. There are also evidences of volcanism in shallower depths of the IFR, however, these features are not as well preserved and have been affected by subaerial erosions and glacier erosional processes during the last ice age. These volcanic features are thought to be part of former rift axes that was probably active 30-55 Ma years ago compared to the age correlations of the surrounding oceanic floor. In the deeper part these ridge volcanic cone or ridge features are well preserved and only partly buried in sediments. They are not age dated but appear to be younger in formation time than the surrounding oceanic floor (30-55 Ma), where volcanic ridges appear to break through the sediments and older crust with evidence of sill intrusions seen on sub-bottom profiler seismic reflection data. This may Indicate a younger volcanic activity and possible still active intraplate volcanic zones that only can be confirmed by sampling, age and petrophysical analysis.