

Conjugate dipping reflectors: implication for multiple ridge jumps during incipient spreading and along the Faroe Bank segment of the NE Atlantic continental margins

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We identified two sets of conjugate dipping reflectors (CDR) in an area west of the Faroe Bank, NE Atlantic Ocean, which is characterised by apparent asymmetric spreading in early Eocene, just after breakup. During breakup, a c. 70 km transverse segment of the continental margin evolved south of the study area.

The two sets of CDR correspond to extinct spreading segments and are located in oceanic lithosphere east of magnetic lineament C21 and terminate southwards on the transverse section of the continental boundary. Each set of CDR comprise a central zone characterised by a complex/chaotic reflection pattern with indication of faulting. Reflectors dipping toward the central zone characterise the areas adjoining the central zone.

Based on a steady-state model of oceanic spreading systems we propose that the outer zones of the CDR are emplaced while magma supply to the rift was sufficient to accommodate both continental separation by intrusion of dykes and the additional emplacement of an effusive succession imaged as the dipping reflectors of the CDR. In contrast, the central zones of the two set of CDR are considered the result of spreading while the magma supply was just sufficient to accommodate continental separation, possibly with some of the separation accommodated by faulting.

Based on published rates of spreading between Greenland and Europe while the two sets of CDR were formed, it is estimated that the eastern set of CDR formed in the first c. 1.7 My after breakup. Following a ridge jump the western set formed in c. 4.8 My.