Transform Faults Encyclopedia Article

Transform Faults

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Transform Faults

Transform faults are a special class of faults first described by the Canadian geologist-geophysicist **J. Tuzo Wilson** in 1965 as faults that terminate abruptly at both ends and link one tectonic feature with another. Transform faults that offset mid-oceanic ridges (ridge-ridge transforms) transfer spreading from one segment of the ridge to the next. An important feature of ridge-ridge transform faults is that the sense of displacement along the transform fault is opposite to the sense of offset of the spreading ridge. The length of the active section of the fault remains constant with time. Fracture zones, across which there is no lateral displacement, continue beyond transform faults. Vertical bathymetric offsets occur across transform faults and fracture zones as young, hotter, and hence higher seafloor is juxtaposed against older and colder seafloor. Transform faults lie along small circles about a fixed Euler pole of **rotation**, implying a constant direction of plate motion. Volcanism and formation of new oceanic **crust** may occur along divergent or leaky transform faults. Transform faults can also occur between two subduction zones (trench-trench or arc-arc transforms) or between a spreading center and a **subduction zone** (ridge-trench or ridge-arc arc transform).

Faults geometrically equivalent to transform faults exist at the outcrop scale, especially in **limestone** and **marble**. Faults that offset two extension fracture veins may form in an equivalent manner to ridge-ridge transforms. Again, the sense of vein offset is opposite to the sense of displacement along the fault. Faults between two domains in which material is lost due to pressure solution (forming stylolites) are geometrically equivalent to arc-arc transforms. Faults between extensional veins and stylolites (on the same side of the fault) show an equivalent geometry to ridge-arc transforms.

See Also

Faults and Fractures; Mid-Ocean Ridges and Rifts; Plate Tectonics; Transform Plate Boundary