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Intra Nazca Plate Subduction as Examplified by the Trujillo Trough off Peru

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The SEAPERC cruise of the R/V Jean Charcot (JULY 1986) covered the TRUJILLO TROUGH which trends N 10° E and extends over a distance of 210 km from the Peru Trench axis at 7° 40 S to 8°45 S southward where it joins the Vera Fracture Zone.

In the Seabeam data the Trujillo Trough separates two blocks of different tectonic pattern. The western block exhibits tensional tectonic features as a succession of horst and graben which strikes N 15° E to N 15° W. The grabens deepen southward as they join the trough. The Trujillo Trough is bounded eastward by a left lateral strike slip fault system. Seismic profiles across the Trujillo Trough indicate compressional features such as folds and faults in the sedimentary fill. The eastern block is uplifted 300 m to 500 m with respect to the western block. The eastern block exhibits a right lateral strike slip faulting which trends from N 40° W to N 30° W throughout the studied area. Faulting of this Eastern Block is consistent with a north-south trending compressional stress which may originate in the spreading process of the Mendana Fracture Zone.

The Trujillo Trough is the site where tectonic structures change from tensional westward to compressional eastward. Thus, we assume that the Trujillo Trough is a newly formed subduction boundary where high decoupling occurs.