

# Cruise Report of Ocean Drilling Program Leg 210 (Newfoundland Margin, the North Atlantic)

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The final Ocean Drilling Program (ODP) cruise, Leg 210 (July-September, 2003) investigated the rifting of the Newfoundland margin in the western North Atlantic. Shirai (ORI, Univ. Tokyo) and Takata (ReCCLE, Shimane Univ.) were the Leg 210 Japanese participants.

Past ODP cruises (Legs 103, 149 and 173) investigated non-volcanic rifting of the Iberia margin in the eastern North Atlantic. The primary objective of Leg 210 was to investigate structure and evolution of conjugate non-volcanic rifted margins -the Newfoundland-Iberia margins-. This first conjugate margin drilling was intended to address fundamental rifting models (e.g. symmetric-asymmetric, etc.). The Cretaceous-Paleogene sedimentary record recovered during Leg 210 also has important Paleooceanographic implications as it is located in the gateway between the Arctic seas and the main North Atlantic Basin.

Site 1276 coring was carried out from around the Eocene-Oligocene boundary (~800 mbsf) to the Albian (~1740 mbsf) with excellent recovery (avg. 85%). Cored sediments consist mainly of pelagic-hemipelagic mudstone and of turbidite commonly composed with carbonate grains (grainstone). The sediments are divided into 5 units based mainly on changes in frequency and thickness of turbidite layers. The Cretaceous-Tertiary (KT) boundary and some ocean anoxic event (OAE) intervals are intercalated within units 3 and 5, respectively. Lower part of the unit 5 (subunit 5C) intercalates a lot of sandy debris flow deposits and two alkaline diabase (dolerite) sills. Sediments adjacent to the sills experienced contact-metamorphism. Coring at Site 1276 terminated in the 2nd sill due to poor hole conditions.

In the final few days of Leg 210, ODP's final site (Site 1277; ~40 km southeast of the Site 1276), recovered basement rocks from a shallowly buried basement ridge.

Sills and metamorphism of sedimentary rocks intensify asymmetry between magmatic Newfoundland margin and nonmagmatic Iberia margin. Sampled basement rocks to sedimentary rocks will reveal the evolution of the Newfoundland-Iberia rifting and the North Atlantic. We present some of the Leg 210 results (sedimentary characteristics, age model and sedimentation rate using microfossil analysis), and our individual research topics (Shirai: X-ray CT imaging of sedimentary structure of consolidated sedimentary rocks; Takata: Eocene-Oligocene paleoceanography based on the analysis of benthic foraminifers).