

Accepted Manuscript

The deep seismic structure of the Earth's crust along the Antarctic Peninsula
– a summary of the results from Polish geodynamical expeditions

Tomasz Janik, Marek Grad, Aleksander Guterch, Piotr Środa

PII: S0921-8181(14)00183-0
DOI: doi: [10.1016/j.gloplacha.2014.08.018](https://doi.org/10.1016/j.gloplacha.2014.08.018)
Reference: GLOBAL 2182

To appear in: *Global and Planetary Change*

Received date: 4 October 2013
Revised date: 6 August 2014
Accepted date: 15 August 2014

Please cite this article as: Janik, Tomasz, Grad, Marek, Guterch, Aleksander, Środa, Piotr, The deep seismic structure of the Earth's crust along the Antarctic Peninsula – a summary of the results from Polish geodynamical expeditions, *Global and Planetary Change* (2014), doi: [10.1016/j.gloplacha.2014.08.018](https://doi.org/10.1016/j.gloplacha.2014.08.018)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



The deep seismic structure of the Earth's crust along the Antarctic Peninsula – a summary of the results from Polish geodynamical expeditions

Tomasz Janik^{1*}, Marek Grad², Aleksander Guterch¹, Piotr Środa¹

¹Institute of Geophysics, Polish Academy of Sciences, Ks. Janusza 64, 01-452 Warsaw, Poland,
*<janik@igf.edu.pl>

²Institute of Geophysics, Faculty of Physics, University of Warsaw, Pasteura 7, 02-093 Warsaw,
Poland

Abstract

A summary of the results of four Polish geophysical expeditions, that constituted an extensive programme of seismic wide-angle refraction experiments in the northern Antarctic Peninsula region between 1979 and 1991, is analysed here. The results include the interpretation of 20 deep seismic sounding profiles located along the western coast of the Antarctic Peninsula. Additionally, a few shallow seismic profiles in the Deception Island area and a total of 10 reflection profiles from the Bransfield Strait and Drake Passage area were carried out. Crustal velocity models extending across the Antarctic Peninsula continental shelf between the Adelaide Island and the Bransfield Strait show a typical continental crustal structure, with crustal thicknesses of 36-42 km near the coast that decreases to 25-28 km beneath the outer continental shelf. Farther north in the Bransfield Strait region, the models document a southeastward dip of the Moho discontinuity from a depth of 12 km beneath the South Shetland Trench to 40 km under the northern tip of the Antarctic Peninsula. Beneath the trough of the Bransfield Strait, a high-velocity body with P-wave velocities exceeding 7.0 km/s was detected in a depth range of 6-32 km.

Keywords: Antarctic Peninsula; Bransfield Strait; West Antarctica; crustal structure; Moho depth; subduction zone

1. Introduction

The tectonic evolution of the Antarctic Peninsula (AP), a 1500 km strip of the continental crust located between the Pacific Ocean and the Weddell Sea, is quite complex. It involves early Mesozoic subduction of the proto-Pacific and Pacific lithosphere (Garrett and Storey, 1987), driving accretionary orogenic processes at the Antarctic margin, followed by Early Jurassic-Early Cretaceous extensional episode related to the break-up of the Gondwana continent. Subsequent middle Cretaceous to Cenozoic convergence of the Pacific and Antarctic plates resulted in

Download English Version:

<https://daneshyari.com/en/article/6348155>

Download Persian Version:

<https://daneshyari.com/article/6348155>

[Daneshyari.com](https://daneshyari.com)