



8<sup>th</sup> Workshop on  
Alpine Geological Studies  
Davos / Switzerland  
10.-12. October 2007



# ABSTRACT VOLUME

sc | nat <sup>sq</sup>

Swiss Academy of Sciences  
Akademie der Naturwissenschaften  
Accademia di scienze naturali  
Académie des sciences naturelles



SCHWEIZERISCHER NATIONALFONDS ZUR FÖRDERUNG  
DER WISSENSCHAFTLICHEN FORSCHUNG  
FONDS NATIONAL SUISSE DE LA RECHERCHE SCIENTIFIQUE  
SWISS NATIONAL SCIENCE FOUNDATION  
FONDO NAZIONALE SVIZZERO PER LA RICERCA SCIENTIFICA



# Crustal structure of Eastern Alps derived from data of recent 3-D WAR/R experiments (Oral)

Michael Behm<sup>1</sup> and Ewald Brückl<sup>1</sup>, CELEBRATION 2000 and ALP 2002 Working Groups

<sup>1</sup> Institute of Geodesy and Geophysics, Vienna University of Technology

Since 1997 several large 3-D wide angle reflection and reflection experiments (POLONAISE 97, CELEBRATION 2000, ALP 2002, SUDETES 2003) were initiated to study the upper lithosphere of Central Europe. The layout of these projects is based on a dense net of seismic profiles and average shot charges of 300 kg. Since the shots were recorded on all profiles, the data set allows for 2-D and 3-D interpretation as well.

We present the most recent seismic models of the Eastern Alps and their transition to the surrounding tectonic provinces (Bohemian massif, Southern Alps, Dinarides, Pannonian domain) derived from CELEBRATION 2000 and ALP 2002 data. The seismic data were processed by different 2-D and 3-D techniques, resulting in P-wave velocity models of the crust and upper mantle, and a new Moho depth map.

P-wave velocity structures of the upper and middle crust correlate well with geologic and tectonic units. Examples of regions with relatively low velocities are sedimentary basins and their basement and granite intrusions in the Bohemian massif. Significant high velocity areas are a

6

deep reaching zone north of the Tauern window, the middle crust of the Tisza unit, and, most pronounced the upper crust of the Adriatic foreland. High velocities in the lower crust are found below the Vienna basin and its north-western and south-eastern surroundings.

The Moho depth map shows a fragmentation of the crust and upper mantle into three parts: the European plate, the Adriatic-Apulian micro-plate, and the newly interpreted Pannonian fragment. The Moho depth map indicates a southward subduction of the European plate below the Adriatic-Apulian plate and below the Pannonian fragment. However, the Adriatic-Apulian Moho dips in north-north-eastern direction below the Pannonian Moho. We interpret that the Pannonian fragment was part of the Adriatic-Apulian plate before and during an early state of the collision. Crustal thinning and Moho uplift of the Pannonian fragment was initiated during the subsequent tectonic escape to the unconstrained margin in the east, represented by the Pannonian basin. Since the Miocene, underthrusting of the Adriatic-Apulian plate below the Pannonian fragment could have been one mechanism of continuing crustal shortening in the region of the Eastern Alps and the most northern Dinarides.

7