steinmanninstitut

TECTONICS & SEDIMENTATION
BONN 2009

# Tectonics & Sedimentation

## - Conference Volume -

Tom McCann, Niko Froitzheim, Jean Thein, Andreas Schäfer

Mon 16th – Wed 18th, February 2009

SEPM-CES
Central European Section

Steinmann Institute - Geology
University of Bonn
Nussallee 8
D-53115 Bonn
Germany

fon +49 (0)228-73.2461
fax +49 (0)228-73.9037

e-mail: tectsed@uni-bonn.de
http://www.steinmann.uni-bonn.de

## Wednesday, 18.2.2009

| | |
|---|---|
| 0900 - 0930 | Keynote by Matthias Hinderer: Balancing of material fluxes. |
| 0930 - 0950 | Oliver Kempf, M. Hinderer, M.P. Süss & J. Flügge: Sediment budget of the upper Middle Keuper (SW Germany). |
| 0950 - 1010 | Hella Wittmann, F. von Blanckenburg & P. Kubik: Cosmogenic nuclide budgeting of floodplain sediment transfer and examples from the Amazon Basin. |
| 1010 - 1030 | Heinrich Bahlburg, J.D. Vervoort & S.A. Du Frane: Crustal recycling in accretionary orogens: LA-ICP-MS geochronology and Hf isotope evidence of detrital zircons in Late Paleozoic turbidite units of the southern central Andes. |
| 1030 - 1100 | **Coffee Break** |
| 1100 - 1130 | Keynote by Dario Sciunnach: From rifting to continental breakup: Case histories from the Tethyan realm. |
| 1130 - 1150 | Luca Costamagna: Sedimentation, tectonics and climate in the development of the Genna Selole Fm (Middle Jurassic of the Tacchi area, Central Sardinia, Italy). |
| 1150 - 1210 | Thorsten Nagel: Upper plate paradox in the northern Red Sea and possible solutions. |
| 1210 - 1230 | Emmanuel Masini, G. Mohn, G. Manatschal, J.-F. Ghienne & F. Lafont: The evolution of supra-detachment sedimentary systems in distal rifted margins (Bernina-Err nappes / SE Switzerland). |
| 1230 - 1400 | **Lunch Break ----------** |
| 1400 - 1420 | Sean D. Willett & F. Schlunegger: The latest stages of evolution of the Swiss Molasse Basin: from foredeep to wedge-top basin. |
| 1420 - 1440 | Edward R. Sobel, R.C. Thiede, L. Schoenbohm, C. Jie & M. Sudo: Is focused erosion enhancing denudation of domes in the Pamir Mountains? |
| 1440 - 1500 | Hugo Ortner, M. Rittner, D. Paton, J. Borer & B. Trudgill: Stratal patterns of clastic wedges in transpressive systems: Gosau Group of Muttekopf (Northern Calcareous Alps) revisited. |
| 1500 - 1520 | Fokko F.N. van Hulten: The northern Dutch offshore – part of a major depocentre. |
| 1520 - 1540 | **Coffee break** |
| 1540 - 1600 | Josipa Velic, T. Malvic, M. Cvetkovic & G. Jovic: Upper Miocene sedimentary rocks along the northern marginal fault of the Sava Depression influenced by syn-sedimentary tectonics (Klostar oil field, Pannonian Basin, Croatia). |
| 1600 - 1620 | Rastislav Vojtko, F. Marko, J. Madaras, J. Betak & F. Preusser: New evidence of neotectonic activity of the Vikartovce fault (Western Carpathians). |
| 1620 - 1640 | Wolfram Wartenberg & A. Schäfer: Tracking the Late Devonian to Cretaceous sedimentary record within a plate-convergent setting in southern Queensland, Australia. |
| 1640 - 1700 | Ulf Linnemann, A. Gerdes, T. Jeffries & F. Pereira: The Cadomian Orogeny and the opening of the Rheic Ocean during the Lower Palaeozoic: Siliciclastic sediments, tectono-magmatic evolution, and basin analysis of the Saxo-Thuringian Zone (Bohemian Massif). |
| 1700 ------- | **Closing** |

# UPPER MIOCENE SEDIMENTARY ROCKS ALONG THE NORTHERN MARGINAL FAULT OF THE SAVA DEPRESSION INFLUENCED BY SYN-SEDIMENTARY TECTONICS (KLOŠTAR OIL FIELD, PANNONIAN BASIN, CROATIA)

Josipa Velić[1], Tomislav Malvić[2], Marko Cvetković[1] and Goran Jović[1]

[1] University of Zagreb, Faculty of Mining, Geology and Petroleum Engineering, Pierottijeva 6, 10000 Zagreb, Croatia

[2] INA-Oil Industry Plc., Exploration and Production of Oil and Gas, Šubićeva 29, 10000 Zagreb, Croatia

The Kloštar field is located approx. 35 km east of Zagreb. The oil production started in the 1954. The field is situated in the Sava Depression, i.e. near the SW margin of the Pannonian Basin. The Miocene deposits (up to 1600 m thick) are transgressive over Palaeozoic magmatites and metamorphites. Upper Miocene deposits are up to 1200 m thick (Pannonian and Pontian ages, the 2nd Neogene megacycle [1]). Oil reservoirs are placed within Miocene sandstones and tectonized Palaeozoic basement. The field structure is composed of an anticline striking NW-SE, faulted by transversal and longitudinal (strike-slip) faults. The main longitudinal fault crosses the central part of the field, representing the continuation of the Northern marginal fault of the Sava Depression [2], [3]. This fault changes the character along the strike (normal fault on the north and reverse on the south). The vertical displacements determined according to the boundaries of stratigraphic units (determined via e-markers) are up to 50 m. The cumulative displacement during the Late Miocene was circa 150 m [2]. The rate of vertical tectonic displacements was increased in the younger sediments, and the maximum was in Late Pontian.

The Upper Miocene deposits, especially of Pannonian age, are mostly turbidite deposits [4], represented by calcitic marlstones, fine-grained sandstones and soft sandy clays. Depositional model indicates change of predominant material sources – from local (Moslavačka Mt., distance of few km) to very distant (the Alps, several hundred km away). Variable transportation energy resulted in often and significant changes of margins and depths of depositional areas. This was caused by the Northern marginal fault and by the transversal fault striking NE–SW across the entire depression [2], [5]. Palynological analyses of Pannonian age samples indicated on lacustric environment, but also on significant influence from the land, i.e. material that originated from marshes, plains and moderately high mountains. Land-derived material had been transported during the period of warm, humid climate [5]. Lower Pannonian depositional environment was mostly shallow, composed of smaller, isolated lakes. Upper Pannonian reservoir sandstones have been deposited only in the western part of the field, in brackish to fresh-water environment. In the latest Pannonian the shoreline had been reduced toward uttermost southwest. During Pontian sedimentation has been active over the entire structure, as evidenced by faster sinking of the hanging wall of the Northern marginal fault.

References

[1]VELIĆ, J., WEISSER, M., SAFTIĆ, B., VRBANAC, B. & IVKOVIĆ, Ž. (2002): Petroleum-geological characteristics and exploration level of the three Neogene depositional magacycles in the Croatian part of the Pannonian basin. –Nafta, 53 (6-7), 239-249, Zagreb.

[2]VELIĆ, J. (1983): The neotectonic relations and development of the western part of the Sava river depression. Acta Geol. JAZU, 13/2, 26-65.

[3]PRELOGOVIĆ, E., SAFTIĆ, B., KUK, V., VELIĆ, J., DRAGAŠ, M. & LUČIĆ, D. (1998): Tectonic activity in the Croatian part of the Pannonian basin. Tectonophysics, 297, 1-4, 283-293.

[4]VRBANAC, B., VELIĆ, J. & MALVIĆ, T. (2008): Sedimentation of Late Pannonian clastic deposits in main and marginal basins (Sava depression vs. Bjelovar subdepression). Geophysical Research Abstracts, Vol. 10, Copernicus Group, 1-2, Vienna.

[5]LUČIĆ, D., SAFTIĆ, B., KRIZMANIĆ, K., PRELOGOVIĆ, E., BRITVIĆ, V., MESIĆ, I., & TADEJ, J. (2001): The neogene evolution and hydrocarbon potential of the Pannonian Basin in Croatia. Marine and Petroleum Geology, 18, 1, 137-147.