ARCHITECTURE, TECTONICS AND SUBSIDENCE MECHANISMS OF THE FOCSANI DEPRESSION – SOUTHEASTERN CARPATHIANS BEND

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In front of the SE Carpathians Bend a very deep basin (Focșani Depression) developed in Miocene to recent times. An important part of the subsidence in Focșani Depression (FD) occurred after the main stages of thrusting in the Carpathians. Apparently, the basin lies in the wrong place and evolved in the wrong time. Around 13 km-thick Badenian-to-Quaternary (<16.5 Myr) sediments were deposited in the central part of the FD. During Badenian (16.5-13 Myr), the foreland (S-ward Trotuș fault) underwent NE-SW extension and NW-trending basins opened in the eastern Moesian platform. A NW-SE-oriented area of subsidence stretched from Transylvanian basin through the FD to the SE of the Moesian platform while thrusting was going on in the East-European/Scythian platform, East Carpathians and Getic Depression. Starting with the Sarmatian (13-10 Myr) the FD depocenter moved out of
the Carpathian belt coeval with the exhumation of South and central-northern East Carpathians. The basin enlarged and was tilted toward the belt. The tilting was accompanied by dextral shearing mainly along Intramoesian and Peceneaga-Camena faults. After Sarmatian times, subsidence occurred practically only to the S-SE of Trotus fault. During Meotian-Pontian (10-5 Myr) the subsidence slowed down in the FD and strongly increased afterwards. This subsidence amplification has been accompanied by normal faulting and shearing in Moesian platform. The western margin of FD has undergone E-ward tilting coeval with the exhumation of the Carpathians Bend and opening of the intramountain basins to the inner part of the belt. Therefore, the subsidence in FD is split in 2 stages: extension-related (Badenian) and flexure-related (Sarmatian-Quaternary). The modeling results of the former stage reveal a small amount of extension, large EET and intermediate-to-deep depth of necking. The latter subsidence stage is modeled through a 3D static-flexural approach using the present-day topography as the only load. The lateral variation of the strength of the lithospheric domains leads to occurrence of a basin (3.5 km-deep) in front of the orogenic load in the Carpathians Bend area. An additional load may be provided by the sedimentary fill of the western prolongation of FD, presently buried beneath the Carpathians Bend structures. Also, this basin would explain the exhumation delay of the Bend orogenic wedge (started at 5-6 Myr ago) as well as the 400-500 m difference in elevation. Together with the effect of N-S intraplate compressive stress, a 6.5 km-deep basin is predicted in FD.