



Interaction of thin and thick-skinned tectonics: an example from a geological transect across the Central Apennines, Italy

V. Scisciani (1) and R. Montefalcone (2)

(1) Dipartimento di Scienze della Terra, Università "G. d'Annunzio" Chieti-Pescara. Campus Universitario Madonna delle Piane, via dei Vestini n. 30 - 66013; Chieti Scalo(CH), Italy

A powerful method to study the external zones of foreland fold-and-thrust belt derives from the integration of surface geological-stratigraphic-structural data with the analysis of subsurface information (i.e. well-log data and seismic profiles interpretation). Such an integrated approach was performed along the Montagna dei Fiori transect by several authors as well as in the present work. More in detail, in this study the outer sector of the Central Apennines of Italy and the Adriatic foreland have been analysed in order to reconstruct the geological-structural setting and the Neogene-Quaternary evolution of the fold-and-thrust belt. Based on fieldwork data, existing geological maps, new seismic data and well information, a regional balanced cross-section has been realized. The transect, about 140 km in length from the inner mountain belt to the Adriatic foreland, illustrates the structural style of the Apennines thrust system, the geometry of the different thrust fronts, the physiography of the foreland ramp and the setting of the syn-tectonic basins infill. Moreover, by sequential-balancing and subsequent forward-modelling of the restored cross-section the migration of the contractional deformation and the tectonic evolution of the chain-foredeep-foreland system has been unravelled, and shortening rates have been calculated. The complex structural setting of the Central Apennines fold-and-thrust belt derived from this study mainly results from the interaction between an extremely thin-skinned thrust system and a thick-skinned tectonics. The former mainly affects the syn-orogenic siliciclastic foredeep deposits and generally predates the emplacement of the second one (i.e. the deeper thrust system) that cross-cuts the whole sedimentary cover (i.e. Triassic-Miocene carbonates and the overlying Messinian-Pliocene siliciclastic sediments) and locally involves the basement. The uncoupling in space and time between thin and

thick-skinned tectonics strictly controls the evolution and the migration of syn-tectonic basins, and influences the sequence of thrust-system propagation; the latter, with respect to the deeper stratigraphic levels, is mainly toward the foreland even if “breaching” thrusts are present. Moreover, spacing and location of thrust ramps are strictly controlled by pre-existing discontinuities that affect the foreland ramp.