Part I
Surficial and Deep Processes in Thrust Belts

Part I of the volume comprises two chapters which deal with several large-scale and first-order features of thrust belts and foreland basins.

Burov (Chapter 1) investigates the interactions between the surface and sub-surface processes by means of thermo-mechanical modelling. One main point is that advection of material at the Earth’s surface and horizontal flow in the lower crust might be coupled so as to permit mountain growth in response to horizontal shortening. This mechanism is investigated on the basis of semi-analytical and numerical experiments in which the rheological layering of the lithosphere and surface processes are modelled. These ideas are tested on well-studied cases such as the Western Alps, the Tien Shan and the Himalaya. Some implications about the role of climate on continental tectonics and on the geomorphology of mountain ranges are derived.

In their paper, Lenci and Doglioni (Chapter 2) address the overall asymmetry of thrust belts by analyzing various convergent margins in terms of geographic polarity of the margin, age and composition of the subducting plate. They argue that the asymmetry between orogens or accretionary wedges is to the first-order global and related to geographically opposed (i.e., W- to E-NE directed) subduction zones, while local/regional stratigraphic-rheological characteristics which may vary along strike, such as the décollement depth, exert only second-order controls on each orogen.