Displacement between tectonic plates is normally partitioned into different tectonic domains accommodating specific components of the bulk strain, such that no single domain can possibly be regarded as representative of the overall kinematics. Eventually, this partitioning can be produced at different scales. Therefore, plate kinematic motion estimations based on the surface geological record should ideally rely on detailed multiscale, structural analyses of all different tectonic domains involved.

The Betic-Rif orogen was formed during the Cenozoic by the convergence and subsequent collision of the Alboran domain and the South Iberian and Maghrebian paleomargins. After the main Miocene event, oblique convergence has been still active up to present times in both branches of the resulting Gibraltar Arc. In this work we analyze how dextral oblique convergence in the northern Betic branch is partitioned into different tectonic domains of the orogen external zones and foreland, where contrasting strain fields are deduced. These domains present distinctive rheologies, thus showing also specific structural styles. As such, we present data of upper Miocene-Present structures from four different tectonic domains along a complete transect of the western Betics (southern Spain), from the internal-external zones boundary outwards. In the inner fold and thrust belt, the detached South Iberian paleomargin and Flysch trough units (mostly limestones and other carbonatic rocks) are deformed mainly by upright and double-verging folds as well as reverse faults, both registering mostly orthogonal shortening. The outer fold and thrust belt progressed toward the foreland incorporating block-in-matrix formations, with evaporite-rich marly matrix, formed ahead the mountain front; its main deformation is resolved at a strike-slip dominated, dextral transpressional zone. The upper Miocene deposits of the foreland basin (calcarenites and marls) are affected by weak deformation combining some shortening and an unconstrained strike-slip component, as deduced from seismic profiles. Finally, Paleozoic structures of the foreland, formerly developed at non- to medium-grade metamorphic conditions, were likely reactivated under a dextral transpressional strain field, which acts in combination with forebulge bending.

The strongly arcuate shape of the Gibraltar Arc likely imposes contrasting kinematics along strike within the same tectonic domain. Indeed, the inner fold and thrust belt shows nearly orthogonal shortening to the west, in a more frontal position, and a strike-slip dominated high-strain zone.
(the so-called Torcal shear zone) to the east. By contrast, preliminary studies show no significant differences in the kinematics of the foreland eastward from the analyzed transect.

All of our kinematic results from the studied domains are compatible with an overall dextral oblique convergence. However, more accurate strain estimations are needed to constrain the plate displacements responsible for the upper Miocene-Recent deformation in the Gibraltar Arc northern branch. Moreover, detailed analyses of strain partitioning modes will shed light into the relationships between these plate displacements and the resulting strain patterns.