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Palaeocurrent data representation in tectonically-driven basins: insight from Ager Basin (Miocene, Spain) and Catanzaro Strait (Pleistocene, Italy)

Domenico Chiarella (1) and Dario Gioia (2)

(1) Weatherford Petroleum Consultants AS, Folke Bernadottes vei, 38, 5147 Bergen (Norway), (2) Istituto per i Beni Archeologici e Monumentali - Consiglio Nazionale delle Ricerche, Tito Scalo (Potenza), Italy

Palaeocurrent measurements are fundamental in studies of sedimentary rocks, since they represent the key to obtain information about palaeogeography and palaeoslope of sedimentary basin. To bear out field visual observations, palaeocurrent measurements have been taken and plotted onto rose diagrams. This kind of statistical representation have some limitations related to an inappropriate selection of both petal width and radius of the circles segments, which can reduce the information that it is possible to take out from palaeocurrent data.
In this work, we discuss two case studies of sedimentation in a tectonically active basin, where the only use of rose diagrams minimize information that is possible to take out from palaeocurrent data. In order to reduce these limitations, we introduce a graphical representation of palaeocurrent data based on the construction of different plot for the several intervals of a sedimentary succession. Such a representation permits to extrapolate information about tectonic evolution of sedimentary basins. In the two proposed examples (Ager and Catanzaro Basin), syntectonic activity had an important role in the basins palaeogeography and related sedimentary processes. In the Ager Basin the activity of the Montsec thrust, testified by the occurrence of an olistolith horizon in the stratigraphic record, probably changed the shape and the orientation of the seaway. In the same way, during the early Pleistocene, the Catanzaro Basin was affected by syn-sedimentary clockwise rotation, related to the spreading of the Marsili Basin in the Tyrrhenian Sea.
Hence, the graphical method proposed in this study allowed revealing syn-sedimentary changes in the geometry of both tectonically-driven basins.