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GR Focus Review

Substrate deformation and incorporation in sedimentary mélanges (olistostromes): Examples from the northern Apennines (Italy) and northwestern Dinarides (Slovenia)

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ABSTRACT

Intense stratal disruption and lithological mixing is generated during sedimentary transport events, highlighting that gravitational processes are efficient mechanisms in the production of different types of mass transport deposits (MTDs) with internal block-in-matrix arrangement. Extra- and intrabasinal MTDs exhumed in orogenic belts worldwide, identified as olistostromes and sedimentary mélanges in the first case, record the final products of the downslope evolution of landslide masses, from slope failures to gravity flows. Specific sedimentary fingerprints are commonly preserved within such “chaotic” rock units, even though usually reworked by polyphased tectonics and associated metamorphism. One of the main conceptual issues in this framework is the occurrence/incorporation of “exotic” clasts and blocks (baseline criterion for mélange definition). We here provide an outline of the primary, multi-scale structures identified in key case studies from the northern Apennines of Italy and the northwestern Dinarides in Slovenia. We focus on mechanisms responsible for the entrainment of intra- (native) and extra- (exotic) basinal material and its progressive deformation. Important information, such as the kinematics of processes and internal strain partitioning, can be reconstructed from the study of such features, providing fundamental paleogeographic and paleo-physiographic constraints, as well as consolidating the basis for a possible updated reappraisal of some classic mélanges.

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