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Gilles Rixhon, Magali Rizza, Pierre Valla, Pierre Voinchet, Paul Ivanez,
Hélène Tissoux

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Abstract 14.S13.4

COUPLING DOSIMETRIC METHODS (LUMINESCENCE AND ESR) WITH GEOMORPHOLOGICAL CONNECTIVITY TO UNRAVEL SOURCE-TO-SINK DYNAMICS IN THE STRENGBACH CATCHMENT (VOSGES, E. FRANCE)

Rixhon G.^[1], Rizza M.^[3], Valla P.^[5], Voinchet P.^[4], Yvanez P.^[1], Tissoux H.^[2]

^[1]ENGEES / University of Strasbourg, LIVE (UMR 7362) ~ Strasbourg ~ France, ^[2]BRGM ~ Orléans ~ France, ^[3]CEREGE ~ Aix-en-Provence ~ France, ^[4]Museum National Histoire Naturelle ~ Paris ~ France, ^[5]ISTerre ~ Grenoble ~ France

Sediment routing systems in fluvial catchments are primarily governed by intertwined climatic, tectonic and man-induced forcings at the centennial/millennial timescales. On the one hand, the scientific community has recently explored the potential of (palaeo-)dosimetric methods to trace sediment dynamics. Luminescence and ESR signals, which were extensively used to date e.g. Quaternary alluvial environments, have been successfully transposed to decipher sediment provenance and transport in fluvial catchments. On the other hand, the geomorphometric index of connectivity has been growingly used over the last decade to quantitatively assess catchment-scale hydrosedimentary connectivity.

This contribution is part of the French ANR QUARTZ research project which aims to use quartz grains as an ubiquitous marker of sedimentary dynamics in order to understand (i) how each quartz grain holds a source-specific signature, and (ii) how this signature evolves along sediment routing systems. This contribution focuses on the second aim by combining measurements of luminescence and ESR signals with assessments of the index of catchment connectivity, and thereby highlights the promising potential of their coupling to quantitatively unravel source-to-sink sedimentary dynamics. A first campaign was performed in the Strengbach catchment in the Vosges Mountains (Vosges, E. France). It represents an ideal natural laboratory. Firstly, the geochemical composition of the source materials has been studied for more than thirty years. Secondly, it contains various quartz-bearing formations (i.e. plutonic, metamorphic and sedimentary) and finally its simple geomorphic configuration allows representative computation of the index of connectivity (or dysconnectivity), not only along the main drain but also in each sub-catchment.