



Comminution age dating of sediments of the Galician Interior Basin, NW Iberia. Insights into sources and climate changes

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Among the time scales that are relevant in geologic studies, those involving sediment transport and deposition are particularly relevant. Much progress has been made on the latter and accurate stratigraphic dating can be achieved with current techniques. On the other hand, sediment transport (including temporal storage) is yet difficult to obtain with a comparable degree of uncertainty. One of the recent developments in this regard is based on the time-dependent depletion of U-234 relative to U-238 in sediment particles due to alpha-recoil ejection off the particles of the decay products of U-238, which allows for the determination of the time elapsed since particle formation to final deposition, commonly referred to as comminution age.

We have used this approach to study Quaternary marine sediments in the Galician Interior basin, in the NW Iberian continental margin, with the aim of using the obtained transport time to gain insight on the provenance of these sediments and improve our understanding on the climatic variability in this region and its effect on the sedimentary record. We have coupled this information with Nd and Sr isotopic signatures and magnetic properties of sediments to further refine the emerging picture of climate variability in this region over the past 80 thousand years.

Overall, our results suggest that during Heinrich Stadials, sediments arrive faster to our study area than during warmer periods, which is coherent with a larger proportion of ice-rafted debris (IRD) in our sediment and more proximity to the terrigenous outlets on the coast due to lower sea levels. However, there is not a clear relationship between these proxies, which is likely affected by changes in the provenance of IRDs and the mechanisms by which detrital allochthonous detrital particles reach the Galician Interior basin, which we have identified as IRDs and ice meltwater plumes. Furthermore, the comminution age technique needs further improvement on the methods to accurately determine the fractional recoil loss of ^{234}U , a critical parameter in the estimation of the comminution age.