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Paleoenvironmental significance of magnetic properties in the Galician continental shelf, NW Iberian Peninsula.

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Organic matter-rich environments, like the Galician Rías Baixas in NW Spain, exhibit a strong diagenetic control on the magnetic properties of their sediments, which constitutes a characteristic feature of this settings.

In contrast, in the continental shelf adjacent to the rías, early diagenetic processes appear to play a secondary role in the magnetic variations of the sediments. This contrast is not fully explained by differences in organic matter content, given that the concentration of this parameter is comparable in some cases.

Combined high resolution magnetic and geochemcial measurements in 6 cores recovered in the Galician continental shelf showed that detrital processes are the main factor controlling the magnetic behaviour of these sediments. Periods of enhanced detrital input were related to peaks of magnetic mineral concentration. The chronology of these cores, based on radiocarbon dating and n the inter-core correlation of concentration-dependent magnetic properties, revealed that the increments in detrital input and magnetic mineral concentration occurred during the recent warm periods of the Holocene, the Medieval and Roman Warm Periods. This is less evident during the RWP, and it is probably related to the dissolution of magnetic minerals caused by the progressive increment of reducing conditions with depth during early diagenesis, rather than a true reduction in detrital input. This is supported by a similar concentration of Hematite in both periods, which , from a magnetic point of view, is more resistant to reducing conditions. The good fit of the magnetic concentration-dependent parameters to a simple steady-state diagenetic model also support these findings. These findings showed that magnetic properties can be used as proxies of paleoenvironmental conditions, in

particular detrital input, in the Galician continental shelf. This could allow for a rapid and inexpensive and non-destructive way of characterizing a large, and spatially more representative, set of cores.

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