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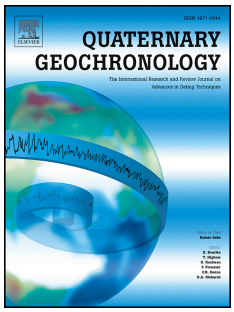

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Deciphering Long-Term Coastal Dynamics using IR-RF and ESR Dating: A Case Study from Médoc, South-West France

Sebastian Kreutzer[1], Mathieu Duval[2,3], Melanie Bartz[4], Pascal Bertran[5], Mathieu Bosq[6], Frédérique Eynaud[7], Florence Verdin[8] and Norbert Mercier[1]

1 IRAMAT-CRP2A, UMR5060, CNRS - Université Bordeaux Montaigne, Pessac Cedex, France

2 Australian Research Centre for Human Evolution (ARCHE), Environmental Futures Research Institute (EFRI), Nathan, QLD 4111, Australia

3 Geochronology, Centro Nacional de Investigación sobre la Evolución Humana (CENIEH), Burgos, Spain

4 University of Cologne, Institute of Geography, Cologne, Germany

5 Inrap / PACEA, Bègles, France

6 PACEA - UMR 5199, Université de Bordeaux, Pessac Cedex, France

7 UMR CNRS 5805 EPOC – OASU, Université de Bordeaux, Pessac Cedex, France

8 AUSONIUS, UMR 5607, CNRS - Université Bordeaux Montaigne, Pessac Cedex, France

Corresponding author: sebastian.kreutzer@u-bordeaux-montaigne.fr

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Highlights

- Middle Pleistocene chronology for the Médoc section (France)
- Combined OSL, multiple centre ESR quartz and IR-RF K-feldspar dating
- IR-RF and multiple centre ESR results show limitations and promises

Abstract

A proper understanding of local palaeoenvironmental histories is an iterative process. Previously settled interpretations suddenly demand a reconsideration triggered by findings from sites not accessible before. The coastline of the Médoc area in South-West France faced considerable recent erosion, providing new valuable insights into the history of the local Holocene and Pleistocene deposits; mainly of estuarine, lacustrine and aeolian origin. In the framework of the project LITAQ for reconstructing the coastal history of the Aquitaine basin, new recently outcropped sediment profiles have been investigated. To establish the chronological framework, for the first time optically stimulated luminescence (OSL) on quartz, infrared radiofluorescence (IR-RF) on K-feldspar were applied in conjunction with multiple-centres electron spin resonance (ESR) dating on quartz. Our approach combines routine luminescence dating application with methodological investigations, with a focus on IR-RF and ESR dating. IR-RF and ESR ages are consistently older than the OSL ages, presumably due to insufficient bleaching, however, they are consistent within 2-sigma. Our study confirms that the investigated area is covered by Holocene sands, following Pleistocene colluvial and aeolian sandy deposits mainly deposited in a periglacial context during MIS 8 and MIS 10. The base of the profiles appears to consist of interglacial estuarine deposits, probably from the Holsteinian (MIS 11), supporting the theory of a progressive replacement of a tide-influenced marsh by a peaty fresh-water pond during that