



## Old Questions, New Archives, and the Challenge Remains: Extending the Temporal Range using Luminescence Dating Methods

Sebastian Kreutzer (1), Marine Frouin (2), and Norbert Mercier (1)

(1) Université Bordeaux Montaigne, IRAMAT-CRP2A, Pessac Cedex, France (sebastian.kreutzer@u-bordeaux-montaigne.fr),  
(2) Research Laboratory for Archaeology and the History of Art, University of Oxford, South Parks Road, OX1 3QY, United Kingdom

Advances in Quaternary geochronology heavily rely on methodological progressions made concerning the chronological tools themselves. Luminescence dating can be considered as only one method out of many others relevant for Quaternary Sciences. Its event-based (e.g., sunlight exposure) character allows directly tracing geomorphological processes using natural mineral grains (e.g., quartz or feldspar) to provide unique insights into the recent Earth's (geologically) history.

Methodological discussions on tools are usually of low interest outside of its particular scientific community, and improvements are hardly noticed immediately and might become eventually overlooked. Thus, our contribution intends to shed light on one specific luminescence dating method called Infrared-Radiofluorescence (IR-RF). It is applied to potassium feldspar and was already proposed by Trautmann in 1999 [1]. IR-RF have been considered to significantly enhance the temporal range (back to the Middle Pleistocene) of luminescence dating. However, due to a lack of commercially available measurement equipment and doubts raised on its overall reliability, applications of IR-RF to geoscientific questions are still rare. In 2012, the IRAMAT-CRP2A started to reinvestigate this method [2,3,4,5] and significantly advanced measurement routines and the overall accuracy of the method. We will present and discuss the state-of-the-art achievements and enduring challenges of IR-RF in the context of Quaternary Science. We will also report a recent chronological study based on a multi-method approach (Electron Spin Resonance, Optically Stimulated Luminescence and IR-RF) deciphering coastal dynamics at the Médoc region (South-West of France). The comparison of the different methods will provide us with a better understanding of the dynamic morphological history of the area, revealing several erosional discordances and accumulation phases ranging from MIS8 to MIS11. The results indicate the general accuracy of IR-RF and show its potential to advance Quaternary geochronological histories significantly.

## References

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