



## **Potential and problems of luminescence dating of Middle Stone Age sites in eastern and southern Africa**

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The later Middle Stone Age in Africa is a key period in human evolution, during which anatomically modern humans are thought to have evolved. Alongside these anatomical changes, a wide range of behavioural changes were also occurring, though the temporal relationship between these two processes is still open to debate. The archaeological record of such changes is fragmentary, and accurate chronological control is vital for piecing together geographically disparate sites. Radiocarbon has been used widely for the period back to about 35-40 ka. For older sites a range of techniques including K-Ar and Ar-Ar have been used in eastern Africa, but these cannot be applied in southern Africa because of the lack of active volcanism during the late Quaternary. In the last decade luminescence dating methods have been applied to a range of sites through eastern and southern Africa.

At some sites, such as Blombos in South Africa, the technique has been spectacularly successful, providing a robust chronology for the Middle Stone Age from ca.70 to 145 ka. At other sites, such as those in the Luangwa valley in Zambia, high environmental dose rates have proved a major obstacle, while in eastern Africa, attempts to study sediments with interbedded tephra so that a direct comparison can be made between luminescence and Ar-Ar have encountered a range of problems that have required the study of new luminescence techniques. This paper draws together experience of the application of luminescence dating to provide absolute chronological control for such sites beyond the range of radiocarbon dating.