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## Early presence of *Homo Sapiens* in South America – a review of about 40 years of geochronological research in the Serra da Capivara National Park, Piauí, Brazil

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The settlement of the Americas, particularly the question of how early *Homo Sapiens* arrived in South America, is a central topic of scientific interest within the archaeological community. Growing evidence suggests an early human presence in the southern part of the American continent, and some previously overlooked findings are now being brought to light and acknowledged. The dating associated with evidence of human presence, regardless of the method used, suggests that humans might have been present 30, 40 or even 50 kyr BP. Among various archeological sites, significant efforts have been dedicated to the region of Serra da Capivara in Piauí, Brazil, for both archaeology and dating, for several decades, since the initial investigations conducted by Niède Guidon and Georgette Delibrias<sup>1</sup> in 1980s.

In this communication, we present a comprehensive analysis of the dating results obtained over the past twenty years, within the framework of systematic characterization of all stratigraphical and/or archeological units. Geochronological modeling is carried out with the ChronoModel software<sup>2</sup>, in particular by using its specific option that allows for the correlation of multiple constraints among datings, events, and units. This feature enables us to link geochronological events by their significance, stratigraphic succession, and their association to the same technical facies, as defined by meticulous and objective analysis of lithic assemblages. With the help of these multiple constraints, we can objectively determine the techno-cultural phases by their boundaries (both start and end) and duration, each associated with a probability distribution.

The meta-analysis of over a hundred <sup>14</sup>C and OSL datings, which characterize more than 50 archeological layers across eight sites in and around the Serra da Capivara National Park, indicates a nearly continuous human presence over the last 40,000 years. Furthermore, it shows varying occupation of these sites depending on the period and their geographical location.

This work is part of the ANR SESAME project (ANR-20-CE03-0005) and of MEAE Piaui archeological mission. The data collection from the LSCE <sup>14</sup>C research laboratory made it possible.

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<sup>1</sup> Guidon N. and Delibrias G. (1986) Carbon 14 dates point to man in the Americas 32,000 years ago. *Nature* 321, 769-771.

<sup>2</sup> <https://chronomodel.com/> - Lanos P. and Dufresne P. (2019) ChronoModel version 2.0: Software for Chronological Modelling of Archaeological Data using Bayesian Statistics, version 2.0.