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Status Reports of a Radiocarbon Sample Preparation Laboratory in Northeastern Brazil

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Establishing a laboratory for radiocarbon analysis is an extremely complex challenge. The need to isolate equipment and sample preparation systems, as well as strict precautions to avoid contamination of materials, chemicals, and consumables used during various sample preparation steps, makes setting up a laboratory for this purpose a mission centered on ensuring result quality. In this context, the Laboratory for Radiocarbon Sample Preparation –LAPA14C (associated with the Stable Isotopes Laboratory –LISE), located at the Federal University of Bahia (UFBA), has undergone several structural modifications to achieve high performance in radiocarbon sample preparation. To assess the quality of results produced by LAPA14C, an intercomparison test was conducted with the Radiocarbon Laboratory (LAC) at the Fluminense Federal University (UFF), a Latin American reference in radiocarbon analysis. This test involved the preparation of several international standards which were graphitized by zinc reduction in LAPA14C and subsequently analyzed using the AMS single stage system at LAC-UFF. The results obtained were consistent with reference values, demonstrating reproducibility and quality, and indicating low contamination levels during the chemical and graphitization processes. However, a small enhancement in the background signal was observed during the measurements, and a new set of C1 and coal samples is being prepared under optimized conditions aiming to reduce this background value. The laboratory has demonstrated satisfactory development toward the implementation of radiocarbon protocols and aims to expand analyses to include soils, sediments, water, carbonates, and bones, all related to paleoenvironmental and archaeological studies. The laboratory is also specializing in water analysis using the precipitation method and the glove bag technique; soil analysis through humin fraction extraction; and determination of the biogenic fraction in materials from renewable sources, such as bioplastics and biofuels. In addition, LAPAC is conducting experimental evaluations of petroleum contamination levels in sediments. More recently, we have been implementing protocols for their application in the field of archaeology

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Altas energias

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