



Environmental Radiocarbon Laboratory

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Introduction

The Environmental Radiocarbon Laboratory at SUERC uses ^{14}C isotope analysis to study the Earth's environment over the past 50,000 years. This includes understanding the modern climate system by identifying the age, sources, and amounts of carbon in different parts of the global carbon cycle.

We work to develop innovative techniques to enable field sampling in challenging environments, and to isolate specific fractions within samples for analysis. We have provided analytical support for UK and international collaborators for over fifty years.

1. Pretreatment



Samples undergo pretreatment to remove contaminants and isolate the fraction required for dating.

2. Conversion to CO_2



Samples are converted to CO_2 either by combustion in sealed quartz tube (organic materials) or acid hydrolysis (carbonates).

3. Cryogenic purification



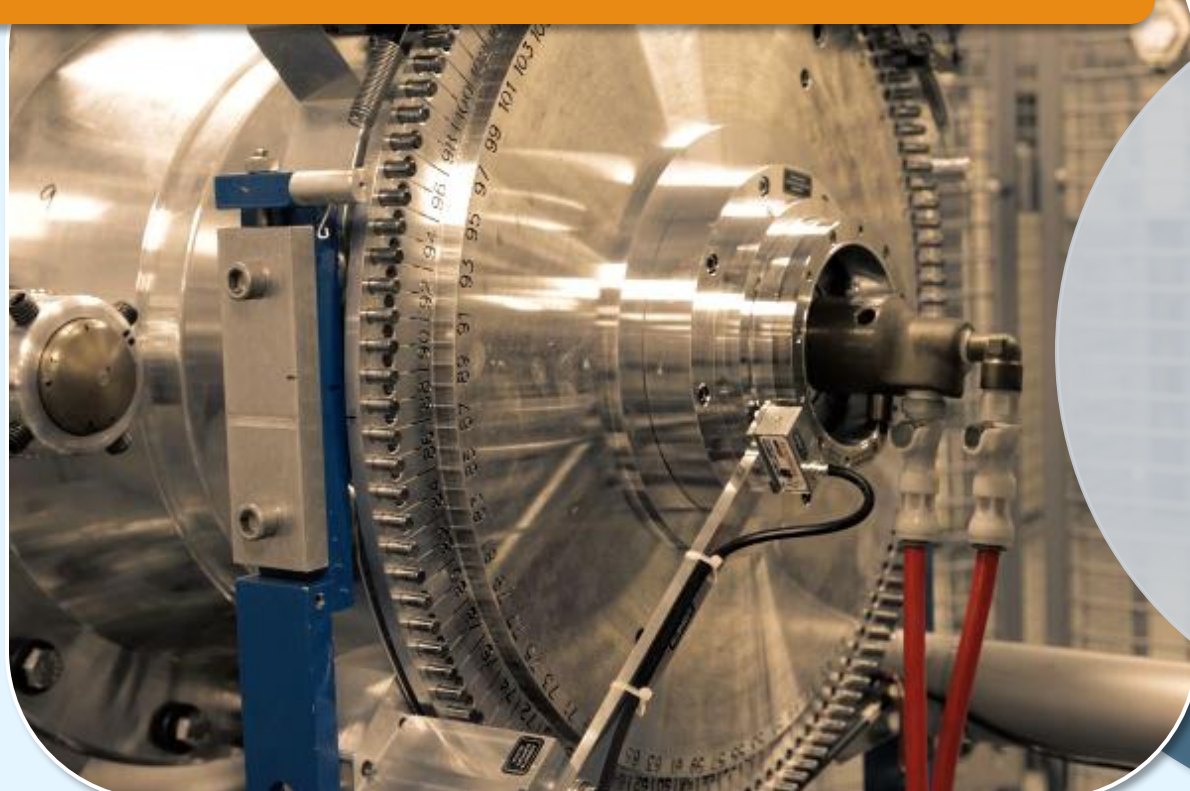
Sample CO_2 is cryogenically purified in custom-built vacuum rigs to prevent introducing atmospheric CO_2 .

4. Graphitisation



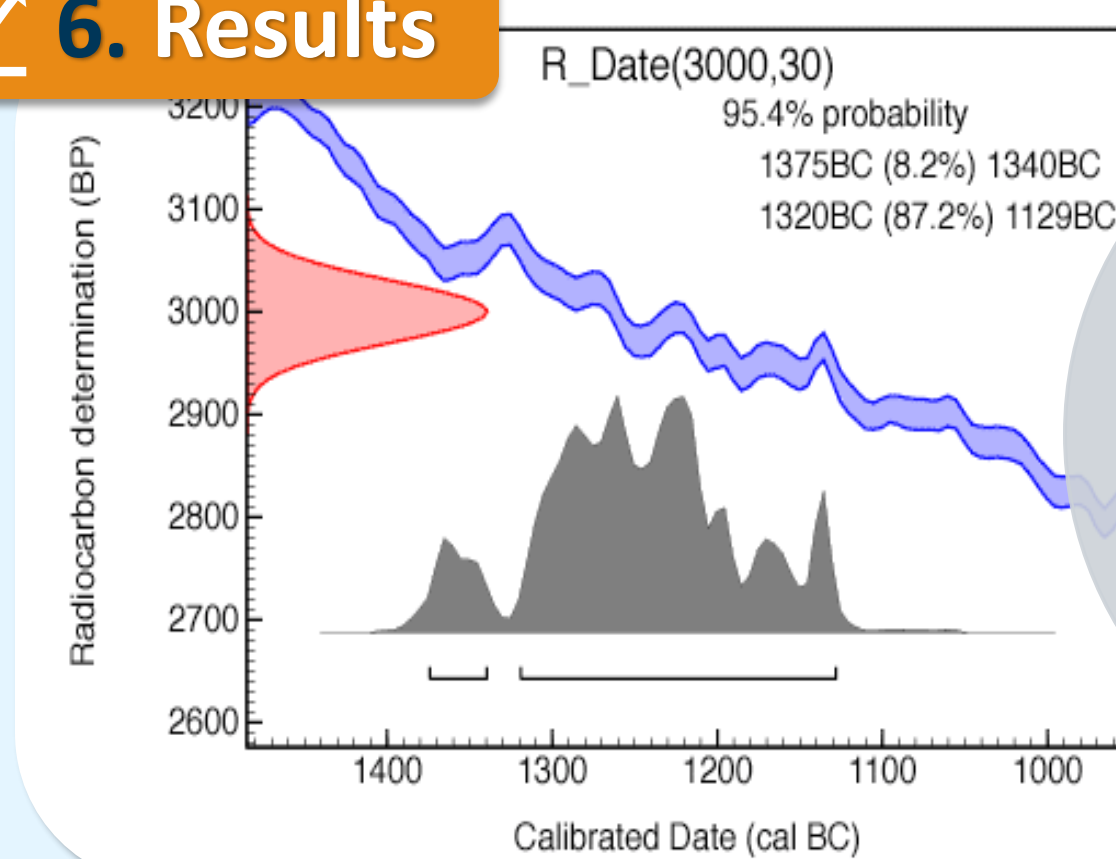
CO_2 is converted to graphite using Fe:Zn reduction method. The graphite powder is pressed into an aluminium sample holder.

5. AMS measurement of ^{14}C



The graphite targets are analysed by accelerator mass spectrometry for radiocarbon measurement / dating.

6. Results



Radiocarbon dates can then be used to help us understand carbon cycling and past climate change.



Ask us about...

Development of novel techniques:

- Hydrogen pyrolysis
- Molecular sieve sampling of CO_2
- Compound specific radiocarbon analysis
- Field sampling methods
- Ramped combustion



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