

## MEASUREMENT OF $^{14}\text{C}$ CONCENTRATIONS OF STRATOSPHERIC $\text{CO}_2$ BY ACCELERATOR MASS SPECTROMETRY

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Air samples of about 16 liters at normal state (1 atm, 0°C) were collected from the stratosphere on September 1, 1989, off Sanriku-Shore, Miyagi Prefecture, North Japan (39°N, 142°E). The samples were collected by a cryogenic sampling device with a liquid helium cooling system, at altitudes of 19, 20, 21, 22, 24, 26, 27, 29 and 30 km. The sampling apparatus flew to the stratosphere on an observation balloon of the Institute of Space and Astronautical Science. Carbon dioxide of a few milligrams of carbon was separated from air samples using a cryogenic method at Tohoku University, and  $^{14}\text{C}$  concentration of the  $\text{CO}_2$  was measured by a Tandem accelerator mass spectrometer at Nagoya University. An Fe-graphite target was prepared by reducing  $\text{CO}_2$  on Fe-powder with hydrogen in a Vycor tube at 500°C. The concentrations,  $\Delta^{14}\text{C}$ , of  $\text{CO}_2$  were 270–310‰ at altitudes of 21–30 km, and 130‰ at 19–20 km. The  $\Delta^{14}\text{C}$  values at 21–30 km were higher than the  $\Delta^{14}\text{C}$  of the current tropospheric  $\text{CO}_2$  of around 100–150‰.

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## CALIBETH – AN INTERACTIVE COMPUTER PROGRAM FOR CALIBRATION OF RADIOCARBON DATES

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A computer program for convenient calibration of radiocarbon data has been developed. It has a simple user interface, which includes pull-down menus, windows and mouse support. All the important information, such as calibration curves, probability distribution and the results in text form, are displayed on the screen and can be rearranged by the user.

Two versions of CalibETH, one for an IBM-PC and one for the Macintosh, are available. On an IBM-PC, CalibETH runs under the graphics interface, GEM, from Digital Research.

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## EVALUATION OF ACTIVE/PASSIVE GUARD MATERIALS WITH AFTER-PULSE ELECTRONICS FOR LOW-BACKGROUND LIQUID SCINTILLATION COUNTING

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Background reduction of a liquid scintillation counter has been evaluated using a spectrum of active/passive guard materials and after-pulse electronics. Guard materials possessing both active and passive properties fall under two basic categories. Passive properties center around near 100%