

波照間島で観測された放射性炭素同位体比のトレンドと季節変動 Trends and seasonal cycle of atmospheric radiocarbon in carbon dioxide observed at Hateruma Island

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We have been conducted monthly air samplings for measurements of atmospheric radiocarbon in carbon dioxide ($^{14}\text{CO}_2$) at Hateruma Island (HAT, 24.05N, 123.80E, 47 m a.s.l.), Japan since 2004. We collected whole air samples using 2.0L glass flasks pressurized to 3 atm, and 5L air was used for radiocarbon analysis. The values of $\Delta^{14}\text{C}$ were measured using compact Carbon Accelerator Mass Spectrometry (CAMS, NEC 1.5SDH). Uncertainty in $\Delta^{14}\text{C}$ measured by CAMS is less than 2 per mil, which is based on the number of ^{14}C counts and the scatter of $^{14}\text{C}/^{12}\text{C}$ ratios during measurements. The reproducibility of CAMS measurements is ± 1.4 per mil (standard deviation of $\Delta^{14}\text{C}$ values in a reference air cylinder).

Here we show the $\Delta^{14}\text{C}$ values of background maritime air observed at HAT from 2004 to 2012. The seasonal cycle of $\Delta^{14}\text{C}$ was observed: minimum in winter-spring and maximum in summer, with amplitude of 10 per mil. Decreasing trends in $\Delta^{14}\text{C}$ were from -5 to -6 per mil/year, however, higher growth rates (less decreasing trends) of -2 per mil/year were observed in 2008-2009. The reason for the IAV in $\Delta^{14}\text{C}$ will be discussed.

Keywords: carbon cycle, carbon isotope measurements, accelerator mass spectrometry