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Evaluation of Calendar Values of the Climatostratigraphic Borders on the Base of Large Sets of 14C Dates

D.J. Michczynska (1), A. Michczynski (1), A. Pazdur (1), and L. Starkel (2)

(1) GADAM Centre, Radiocarbon Laboratory, Institute of Physics, Silesian University of Technology Krzywoustego 2, 44-100 Gliwice, Poland (Danuta.Michczynska@polsl.pl), (2) Institute of Geography and Spatial Organization, Department of Geomorphology and Hydrology of Mountains and Uplands PAS, Sw. Jana 22, 31-018 Krakow, Poland (starkel@zg.pan.krakow.pl)

Two large sets of radiocarbon dates (785 dates for peat samples and 331 dates for fluvial sediments) were used to establish calendar values of the climatostratigraphic borders for the last 16 ka. All samples were collected from the territory of Poland and dated in Gliwice Radiocarbon Laboratory. For both sets Probability Density Functions (PDFs) were constructed by summing the probability distributions of individual 14C dates after the calibration. In the previous analysis (Michczynska and Pazdur, 2004; Michczynski and Michczynska, 2006) authors noticed and discussed the presence of high narrow peaks of the PDFs. Their appearance is caused by two facts:
1. Calibration curve is a record of the environmental changes in the past. The steep slope sections of the calibration curve work as an amplifier and increase the height of the PDF.
2. Environmental changes are indirectly recorded in the frequency of radiocarbon dates because of preferential sampling - the general rule of taking samples from places of visible sedimentation changes (e.g. from the top and bottom of the peat layer) may be the reason that samples from the border of the Late Quaternary climatostratigraphic subdivisions are collected essentially frequently.
The high, narrow peaks of the PDFs are produced both by preferential sampling and through the influence of the calibration curve shape. This fact may be useful to establish the border of the Late Quaternary subdivision on the calendar scale for the analyzed geographical area.

References:
Michczyński A., Michczyńska D.J., 2006. The efect of pdf peaks' height increase during calibration of radiocarbon date sets. Geochronometria, 25: 1-4.
Michczyńska D.J., Pazdur A., 2004. A shape analysis of cumulative probability density function of radiocarbon dates set in the study of climate change in Late Glacial and Holocene. Radiocarbon, 46(2): 733-744.