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Process interpretation of laminated lacustrine sediments from the valley of the river Alf, Quaternary West Eifel Volcanic Field, Germany

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High-resolution annually laminated sediment archives from lakes Holzmaar and Meerfelder Maar located in the Quaternary West Eifel Volcanic Field are in the focus of many investigations (e.g. Brauer et al. 2001, Zolitschka 1991). These publications are related to predominantly biogenic varves covering the last ca. 14 ka years, i.e. the Lateglacial and the Holocene.
In our study, laminated sediments consisting of clay-silt couplets are presented from paleolake Alf. This paleolake formed in a valley dammed by volcanic products, and covers the Pleniglacial between 31 and 24 ka BP (Pirrung et al. 2007).
The focus of our study is the characterization of the structure of clay-silt couplets and the determination of their origin. The applied granulometry revealed mean grain sizes of 10 μm for the light laminae (colors refer to core scan photo) and 14 μm for the dark laminae (both middle silt). X-ray diffraction confirms identical mineral phases for light and dark laminae, with light laminae being clay-enriched containing a higher amount of sericite and chlorite while dark laminae are enriched in quartz. X-ray fluorescence and detrital microfacies analysis on thin sections indicate that calcite dominates in the dark laminae. Microscopically, three different types of silt layers are present. Type I are laminae with homogeneous sublayers, Type II are graded laminae and Type III are laminae with graded sublayers. Processes causing the formation of these silt lamination types can be attributed to repeatedly occurring snow melting, permafrost thawing or rain events linked with sediment delivery from the catchment into the lake. The amount of precipitation and melt water, sediment discharge and density stratification lead to gravity suspension fall out, partial erosion of previously deposited unconsolidated sediments and resuspension in the lake.

Brauer, A., et al. (2001). Lateglacial varve chronology and biostratigraphy of lakes Holzmaar and Meerfelder Maar, Germany. Boreas 30(1): 83-88.

Pirrung, M., et al. (2007). Hochauflösende fluviolakustrine Sedimente des jüngeren Pleistozän aus dem Alfbachtal bei Gillenfeld (Westeifel) - erste Ergebnisse. Mainzer geowissenschaftliche Mitteilungen 35: 51-80.

Zolitschka, B. (1991). Absolute dating of late-Quaternary lacustrine sediments by high resolution varve chronology. Hydrobiologia 214: 59-61.