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# Lithostratigraphy of Lake Van sediments over the past 400.000 years

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Within the frame of the International Continental Scientific Drilling Program (ICDP) project PALEOVAN, a partly laminated sediment record from Lake Van, a closed lake situated in a climatically sensitive semiarid and tectonically active region in Eastern Anatolia, has been drilled in summer 2010. At two sites, Ahlat Ridge (AR) and Northern Basin (NB), sedimentary records of 220 and 140 m were recovered, respectively. Preliminary results from 1) core-catcher analysis during drilling operations in the onshore laboratory and from 2) facies analysis during the first core-opening and sampling party in spring 2011 at the IODP core repository in Bremen document the sedimentological and geochemical succession. The composite profile from the Ahlat Ridge, is composed of seven parallel holes and is in total 218.5 m long including 29 gaps of total 19.7 m. The sedimentary record consists of cm- to m-thick beds of lacustrine (62% of AR) and pyroclastic (9% of AR) deposits. Interbeddeding of alternating cm-thick beds of lacustrine and pyroclastic deposits are defined as intercalations (18% of AR). Most spectactular are numerous beds containing hundred to thousands of fine sub-mm laminae (15% of AR) which are interpreted as varves (in analogy to the modern depositional environment). In general, the laminated and non-laminated lacustrine clayey silt, is composed of clay minerals and carbonate. On the basis of macroscopic sediment descriptions, six lacustrine (L) lithotypes are defined within the sedimentary succession: Ll) laminated clayey silt, Lf) faint laminated clayey silt, Lmo) mottled clayey silt, Lb) banded clayey silt, Lm) massive clayey silt, and Lg) graded clayey silt Each lithotype appeared in various colors and the color changed drastically during oxidation. However, prominent sediment colors are brown, grey, crème, greenish and red tones. Eye-catching single red and green laminae are observed within the laminated clayey silt. Microscopically, mainly autochthonous carbonates are observed next to vitric glass and amorphous organic material. Well-preserved centric and elongated diatom frustules appear in particular below 190 mcblf. Additional to the lacustrine and pyroclastic deposits, the lowermost sediment is composed of gravel and is overlain by sand deposits that contain fresh-water gastropods (*Bithynia*). Apart of the undisturbed bedding and lamination, irregular stratification and deformation structures such as disturbed laminations, microfolds and microfaults were observed frequently. The sharp and great downcore lithologic variability is indicative of a highly and rapidly changing depositional conditions forced by lake-level and other climate-driven changes and by tectonic events over the past 400.000 years. The basal Ahlat Ridge sequences reflect the early transgressive state of the lake's history, and it's evolution from an open to a closed system, i.e. from fresh to saline water, because the site reached acoustic' basement, which to its lithology (indicative for a beach-like environment) and hard nature, could not be penetrated further. Upcore, glacial (banded to massive) and interglacial/interstadial periods (laminated) are interpreted from the lithological succession. Argon-argon dating, magnetostratigraphy and orbital tuning will be used to establish an age model. Complementing the age model, with varve counting enables us to study signals at decadal

to annual resolution. Standardized sample sets (every 20 cm) for ongoing multiproxy analysis will give detailed insight into paleoclimatological and paleoenvironmental conditions. This unique paleoclimate archive hints to a fascinating evolution of the environment and has ideal prerequisites for the investigation of the Quaternary climate evolution in the Near East.