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High resolution paleoenvironment reconstruction for Lake Khanka since the last glacial maximum

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Abstract: A novel sedimentary sequence is presented based on sediment core in the Khanka Lake (XKH1, collected form the small Khanka Lake) by using of paleomagnetic stratigraphy, grain size and organic geochemical data. The sedimentary history of XKH1 is distinctly retrieved to 24 ka BP by comparing with the geomagnetic inclination lows recorded in XKH1 and Lake Biwa. Multi-proxies paleoenvironmental reconstruction for Lake Khanka since the last glacial maximum (LGM) by grain size, total organic carbon (TOC), magnetic susceptibility (MS), and color reflectance. During 24 and 19.5 ka BP, Lake Khanka experienced low lake level and cooling-wet climate approved by the decreasing mean grain size, high sediment brightness and MS values, and low TOC value. The relatively high sand fraction and slightly variation also indicate a low lake condition between 19.5 and 15 ka BP. High TOC content and marked variation in others proxies represent a peat swamp deposition environment during 19 and 16 ka BP, which may associated with lower precipitation and probably modulated by the restrained Asian summer monsoon. From 16 to 15 ka BP, the lake condition change to cold-dry and the sediment has lower content of TOC and coarser grain size. During the deglaciation, together with global temperature rising, the effective precipitation increase around Lake Khanka, result in rising of lake level. The fluctuating characteristics of the environment sensitive grain content are corresponding well to the Oldest Dryas/Bolling-Allerod/Younger Dryas periods. Since 10.6 ka BP, the lake level slightly declining under warm climate because a successive sand bar developed between the small Khanka Lake and the main water area.