A new Late Holocene paleosecular variation sedimentary record from central Asia (Lake Issyk-Kul, Kirgyzstan)

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Major progress in geomagnetic research can be made providing new reliable and well-dated paleomagnetic data from unexplored regions. One of the regions in the world with a strikingly poor data coverage is Asia, where only three sedimentary paleosecular variation (PSV) records are available for the Late Holocene. From these records, the one from Lake Aslikul spans from 2200 yr BC to 1200 yr AD with a relatively high resolution [Nourgaliev et al., 1996]. The Aral Sea PSV record has a similarly high resolution but covers only from 400 to 1200 yr AD [Nourgaliev et al., 2003]. In contrast, the Lake Baikal data extends beyond the Holocene but with a much lower resolution [Peck et al., 1996]. In this paper we present a new PSV record from central Asia that covers the last 3850 years and was obtained from paleomagnetic study of Late Holocene sediments from Lake Issyk-Kul. The excellent paleomagnetic behavior observed, the consistency of paleomagnetic results between consecutive samples, the robustness of the radiocarbon-based age model, and the location of Lake Issyk-Kul make these lacustrine sediments an ideal recorder of paleosecular variation (PSV) in central Asia. Moreover, the PSV obtained is strikingly consistent with those from lakes Aslikul and Baikal. Comparison between the different PSV records from central Asia and geomagnetic global model predictions indicates that these models are not well constrained in this region, probably due to the scarce data available. The new data represents a new Late Holocene PSV record for central Asia, covers the existing gap for this region, and will help to improve future regional and global geomagnetic models. This is a new step in order to construct a master PSV curve for central Asia, which must be based on several independently-date PSV records, and that once defined, could be used as a new chronological tool in this region.