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Towards a regional Late Pleistocene and Holocene Paleomagnetic Secular Variation stack for the Tibetan Plateau

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High-altitude lakes on the Tibetan Plateau preserve sensitive records of hydroclimate and atmospheric circulation, but establishing robust chronologies is often hindered by core-recovery artifacts, section-to-section discontinuities, and uncertainties in radiocarbon dating. Here we present a paired paleomagnetic strategy based on sediment cores from two high-altitude Tibetan lakes, Taro Co and Nam Co, to develop reproducible geomagnetic tie points for inter-core and inter-basin correlation.

For Taro Co (31°07'53.89"N, 84°07'50.65"E; ~4,566 m a.s.l; ~474 km²; max depth 130 m; catchment ~7,423 km²), we target two 8 m long parallel sediment cores spanning ~25 kyr. In parallel, we apply the same workflow to sediments recovered by the ICDP NamCore project from the central basin of Nam Co (30°30'–30°56'N, 90°16'–91°03'E,~4,718 m a.s.l.,~2,017 km², catchment ~10,680 km²,max depth ~99 m), enabling a comparison between independent sedimentary archives from the Tibetan Plateau.

We perform stepwise alternating-field demagnetization of the natural remanent magnetization (NRM) and determine characteristic remanent magnetization (ChRM) directions using principal component analysis (PCA). The datasets include inclination, relative declination, maximum angular deviation (MAD), and median destructive field (MDF), measured at 1 cm stratigraphic resolution. A key methodological focus is quality control across core sections and overlaps in both records: we assess directional stability and evaluate consistency between overlapping intervals to maximize recovery of the paleomagnetic secular variation (PSV) signal. Initial results from Taro Co show strong agreement in inclination between the two parallel cores, supporting the reproducibility of the PSV signal across holes.

The resulting PSV curves from Taro Co and Nam Co provide an independent stratigraphic framework to (i) test and refine radiocarbon-based chronologies, (ii) strengthen correlations between parallel holes/sections within each lake, and (iii) identify shared directional highs and

lows between lakes. Ultimately, our goal is to build a preliminary inter-lake PSV stack for the SW/central Tibetan Plateau, improving regional synchronization and helping separate geomagnetic variability from site-specific recording effects.