

## OSL dating of Holocene Yangtze delta sediments: implications for sedimentation mechanisms

SUGISAKI, Saiko<sup>1\*</sup> ; BUYLAERT, Jan-pieter<sup>2</sup> ; MURRAY, Andrew<sup>3</sup> ; TADA, Ryuji<sup>1</sup> ; ZHENG, Hongbo<sup>4</sup> ;  
WANG, Ke<sup>5</sup> ; SAITO, Keita<sup>1</sup> ; IRINO, Tomohisa<sup>5</sup> ; UCHIDA, Masao<sup>6</sup>

<sup>1</sup>University of Tokyo, <sup>2</sup>Aarhus University, <sup>3</sup>Technical University of Denmark, <sup>4</sup>Nanjing Normal University, <sup>5</sup>Hokkaido University, <sup>6</sup>National Institute for Environmental Studies

Flood events in the Yangtze River are associated with variation in East Asian Summer Monsoon (EASM) precipitation. Understanding the frequency and scale of the EASM precipitation during the Holocene is a key to understanding the mechanism and cyclicity of floods and droughts. Because about 70% of the annual discharge occurs during the flood season, the Yangtze delta sediments provide a good archive of EASM precipitation. In this study, we investigate the possibility of applying OSL dating to establishing high-resolution chronologies for the Yangtze delta sediment cores YD13-1H and G3. The objectives of this study are: (1) test whether fine grained quartz in present day suspended particle matter (SPM) is fully bleached or reset before deposition, (2) where possible, test quartz fine- and coarse-grain OSL dating against radiocarbon shell ages, (3) interpret the sediment transport processes through the differential bleaching of quartz and feldspar OSL signals.

We show that the SPM collected from the surface water column of the Yangtze River during the flood season is well-bleached (offset ~60 years). Fine-grained pro-delta sediments are thus potentially a good dosimeter for OSL dating. OSL ages sediment cores indicate a pronounced change in sedimentation rate at ~6 ka and ~2ka. These events are consistent with what is known of the evolution of the Yangtze catchment and delta. The delta began to build at ~6 ka (Zhao et al., 1979), and human activities increased significantly in the catchment at ~2ka (Chen et al., 1985). The question of whether significant deposition was limited to 2 ka and 6 ka, or whether the record has been disturbed by erosion/reworking remains. These issues are discussed in terms of the reliability of the quartz OSL ages, the degree of bleaching by comparison with polymineral OSL signals, and the relationship of the OSL ages to the sedimentary record.

Keywords: Optically stimulated luminescence, Holocene, Yangtze Delta