

Burial history of the Gonghe Basin, northeastern Tibet, constrained by in situ cosmogenic radionuclides

*Yoshiki Shirahama¹, Atsunori Nakamura¹, Yosuke Miyairi², Honglin He³, Ken-ichi Kano⁴, Shinsuke Okada⁵, Yusuke Yokoyama², Yasutaka Ikeda⁶

1.National Institute of Advanced Industrial and Science Technology, 2.Atmosphere and Ocean Research Institute, The University of Tokyo, 3.Institute of Geology, China Earthquake Administration, 4.Center for Integrated Research and Education of Natural Hazards, Shizuoka University, 5.International Research Institute of Disaster Science, Tohoku University, 6.Earth & Planetary Science, The University of Tokyo

Tibetan plateau has been growing up and expanding its area laterally due to the collision between Indian and Eurasian Plates. The marginal deformation of the plateau related to the lateral growth formed many mountain ranges and inter-mountain basins surrounding the plateau. Understanding development and sedimentation histories of them is an important key for revealing the growing process of the northeastern plateau. Gonghe Basin, one of the inter-mountain basins at the northeastern margin of the plateau, is located about 3200 m above the sea level and bordered by Qinghai Nan Shan and Heka Shan on the north and south, respectively. Previous researches reported that after the Yellow River filled the basin with over 500 m thick clastic sediments, the river has been cutting down through the sediments and formed many fluvial terraces. In order to reveal the process, we applied detailed geomorphological mapping, and surface exposure and burial dating by using in situ cosmogenic radionuclides (CRNs). In this presentation, we will mainly introduce burial ages of the basin sediment and their implications for early stage of development of the basin.

For cosmogenic burial dating, quartz pebbles in the basin fill were collected from the nine sampling sites locating every 50 m depth in the valley. As ^{10}Be and ^{26}Al have different decay constant, $^{26}\text{Al}/^{10}\text{Be}$ -ratio yield the time elapsed since shielded from cosmic rays. Calculated burial ages are in remarkable stratigraphic order from top to bottom of the fill. Each of the deposition rates determined from the burial ages are almost the same deposition rate of about 70 mm/kyr. This indicates that the basin had been constantly filled since the late Miocene. In the presentation we will also discuss an effect of constant deposition on burial ages and rejuvenation resulted from down cutting of the Yellow River.

Keywords: Tibetan Plateau, Gonghe Basin, cosmogenic radionuclide, burial age