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## **Control of Rift Segmentation on Depocenter Distribution on top of the Kavala Island Ridge Accommodation Zone, Central Lake Tanganyika, East Africa**

Using deep penetrating and high resolution seismic reflection data in Lake Tanganyika, we present an integrated tectono-stratigraphic model for lacustrine rift sub-basins developed atop the Kavala Island Ridge, a rift-related high relief accommodation zone (horst block). The Kavala Island Ridge cuts obliquely across Lake Tanganyika, extending northwest of the Mahali Mountains for 65 km, across to the western shore. The Ridge is about 30 to 35 km wide and water depths range from ~35 m to 400 m. Fault segmentation occurs at a spacing of about 5-15 km along strike, and is in response to the growth of border fault systems. The pronounced uplift of the ridge is inversely proportional to the deposition of adjacent sedimentary sequences. Drainage patterns atop the ridge are controlled by segmentation structures that consequently control the synrift facies distribution.

Three distinct stages in the structural and stratigraphic evolution of the ridge are identified: Stage 1-An initial growth stage when the major faults are initiated and extend along strike. Stage 2-A period of rapid extension atop the ridge, when sub-basins develop fan-shaped cross-sectional morphologies due to active bounding-fault subsidence; Finally Stage 3-A period of lesser fault activity, characterized by drape of hemipelagic sediments over the ridge. It appears that the rift basin stratigraphy records an 'early stage 1' of slow subsidence probably followed by sharp increases in subsidence rate.

This example of sequence development atop a major accommodation zone may be an aid to exploration/exploitation geologists and geophysicists characterizing syn-rift reservoir targets in ancient extensional systems.