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Basement Controls on Structure and Sedimentation in the Offshore Zambezi Delta Region

Gas markets are growing in southern Africa, with large gas development projects currently in planning and/or development stages. The coal-based economy of the Republic of South Africa is moving towards greater use of cleaner-burning gas. Additional exploration successes would be timely in fueling the region's burgeoning appetite for gas.

Hydrocarbon potential within the Mozambique Basin of southeastern Africa is solidly established with respect to gas and condensate. The basin hosts commercial production from the giant coastal-onshore Temane (1.8 Tcf reserves) and Pande (2.6 Tcf reserves) gas fields, and is home to the onshore Buzi gas discovery located farther north on the coast. With respect to oil, shows have been reported in some offshore wells - potential thus exists for oil production from the basin.

The Temane-Pande-Buzi trend is parallel with the eastward-flanking Zambezi Delta Depression, a major locus of ancient and modern southeast-prograding sediment fans. Impressive post-Karoo sediment thicknesses in excess of 12 kilometers occur locally within the depression. The Zambezi Delta Depression is widely believed to have sourced the producing reservoirs at Temane, Pande, and Buzi - providing both the organic source material as well as the burial/maturation conditions required to generate hydrocarbons.

We investigate basement control on structure and sedimentation in the offshore Zambezi Delta region - our interest being in how these factors possibly influence hydrocarbon prospectivity. Low-cost open-file geoscience data are an effective qualitative aid for basin reconnaissance. Gravity and magnetic structural modeling, along a profile traversing the offshore fan system, provides more detailed information on basement structural configuration and depth.