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Please fill in your abstract title.	An Integrated Stratigraphic Modeling Approach to Understanding Tectono-Sedimentary Systems in Exploration Frontier Areas	

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Abstract

Objectives/Scope:
Compared with the oil fields in production stages, exploration frontier areas have relatively limited "hard data" available to understand the tectono-sedimentary systems. Therefore, it is a challenge to understand the sedimentary systems in local areas, which are influenced by the regional complicated tectonic movements such as salt tectonics.

Methods, Procedures, Process:
In this study, an integrated methodology, combining qualitative sequence stratigraphy studies, quantitative stratigraphic modelling and optimization, has been adopted to quantitatively characterize submarine fan systems in the exploration frontier areas with limited well control.

Results, Observations, Conclusions:
A qualitative understanding in characterization of the sedimentary systems has been gained through traditional stratigraphy framework based on seismic and well log interpretation. Subsequently, several different conceptual models were proposed to test the development of sedimentary systems with different combinations of input parameters. The detailed internal architecture of sedimentary units was quantitatively modeled by forward stratigraphic simulation. An in-house inversion module was developed to systematically retrieve input parameters such as sediment flow components used in forward numerical modelling. A reasonably good match between the observed thickness from seismic and lithological trends from the well data has been achieved in a calibrated model. The resulting best-fit models indicate that submarine fan systems display a stacking pattern of progradation, aggradation and retrogradation. Sediment supply and fault-controlled graben subsidence are identified as the key factors in controlling this submarine fan system.

Novel/Additive Information:
This integrated workflow/methodology can facilitate the identification of the controlling factors on the development of sedimentary systems, refining the delineation of the graben fills, developing a sediment dispersal model, identifying sediment sources, and characterizing potential reservoirs at higher resolution. It also leads to a reduction of uncertainties in predicting distribution, geometry and characteristics of reservoir in exploration frontier basins.