Seminar Geosains Kebangsaan 2007 (NGC 07)
Universiti Malaysia Sabah, Kota Kinabalu, Sabah
7 – 9 June 2007

P4A-1

A REVIEW OF STRATIGRAPHIC SIMULATION TECHNIQUES AND ITS APPLICATIONS IN SEQUENCE STRATIGRAPHY AND BASIN ANALYSIS

Ku Rafidah Ku Shafie & Mazlan Madon
Petronas Research & Technology Division, Bangi Research Centre, Kawasan Institusi Bangi, 43000 Kajang.

ABSTRACT

Stratigraphic simulation is a modeling methodology that can be used for exploration purposes to understand the key factors (sea level changes, subsidence, sediment supply rates) that control the stratigraphic geometries and architectures of a basin. Its application offers many advantages to scientists and researchers in a sense that it provides a globally accessible platform to understand the complexities of sequence stratigraphy. It models stratal patterns in various tectonic settings such as in passive margins, foreland basins, retroarc foreland basin, interarc basin, remnant ocean basin, growth faulting, and salt diapirs. It enhances biostratigraphic interpretation as it provides age constraints for stratal geometries and sequence stratigraphic interpretation. This can lead to a systematic prediction of other geological aspects such as the identification of source rocks, seals, and reservoirs. Furthermore, it may also lead to the identification of new reservoirs within oil and gas fields. One type of stratigraphic simulation that is often used is a "forward stratigraphic simulation". This model is usually applied for prediction of depositional history of an existing basin. In this paper, four simulation techniques (CSM, SEDPAK, DIONISOS, and SEDSIM) and their applications are presented. The models are typically applied to verify and infer the potential for hydrocarbon entrapment and accumulation within a basin. For this reason, it is useful for exploration purposes in oil industry. The models are also used as teaching tools for young geologists.