

**AAPG International Conference
Barcelona, Spain
September 21-24, 2003**

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An Integrated Quantitative Basin Analysis Approach applied to deep offshore Campos basin, Brazil

An integrated approach has been promoted and applied to the exploration in the Campos basin. It combines a geochemical expertise on reservoirs fluids and sea floor indices, with a regional geological synthesis. Quantitative consistency between the likely geological scenario and the various type of data used (regional topography, gravity, heat flow and wells temperature and maturity), is achieved through the use of a 2D geological modelling at various scales. This modelling approach relies upon an in-house procedure, TRAPS (TRAnsfers in Petroleum Systems), that couples a palinspastic restoration of the basin (Geosec2D⁰) with a lithospheric scale thermo-mechanical modelling (MARGE, in-house software) and a detailed modelling of Hc generation-migration from basin to prospect scale (Temispack2D⁰).

This procedure tested and applied in the deep and ultra-deep offshore Campos basin, has been successful in a very challenging environment. The exploration well drilled in the block BC2, at the toe of the shelf, some 150 km away from closest well tie, did confirm the predictions made on: present day temperature state and level of biodegradation, thermal history endorsed by the basin in the area, maturation and origin of the HC found. It also provided some guidelines about the HC quality.