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The Relevance of the Integration between High-Resolution Geochemical Data and Compositional Petroleum Systems Models in Frontier Areas of Exploration

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To obtain a sharp knowledge of the primary characteristics of the petroleum systems in a frontier area is not an easy task due to two major aspects: (1) the lack of relevant data and, (2) how the sparse information is put together to form a coherent exploratory petroleum system model. It is common sense that in frontier areas the less information you have more important they become. Therefore, assuming that a reliable geological integration of all data is achieved the management of critical exploration risks lies on the type and quality of the data. By “type” of information refer to, for example, specific geochemical parameters that allow insights into the degree of maturation, mixture, source type, etc, in order to provide useful calibration with compositional models, and “quality” refers to the degree of confidence of the actual data. Moreover, geological, geophysical and geochemical data derived from many sources have to be integrated in a consistent model in order to provide first order magnitude insights into petroleum systems. We provide examples that were performed in frontier areas of the Brazilian margin, and illustrate the importance of a good coupling between both “type” and “quality” of high resolution geochemical parameters, a reasonable integrated knowledge of the geology of the region and the use of calibrated compositional petroleum systems modeling. The use of reliable assessment tools and well calibrated models in areas such as the Foz do Amazonas or the Equatorial margin of Brazil, represents the actual difference between exploratory success and failure in new frontier areas.