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**2D and 3D Modeling the Petroleum System of the Berkine and Illizi Basin,  
Eastern Algeria**

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The Berkine Basin (former Ghadames Basin) is one of the most petroliferous sedimentary basins of Northern Africa that enjoyed major exploration successes over the last few years and still has a great exploration potential left. The Illizi Basin is a mature petroleum bearing basin whose petroleum system is still not well understood. The goal of this study is to perform a systematic study of the petroleum system of these two basins using 2D and 3D basin modeling, benefiting from Sonatrach's data base and IFP/Beicip's modeling expertise, in order to understand the generation and migration of petroleum fluids in time, with particular reference to volumes and HC type generated and expelled pre- and post-Hercynian. The regional 3D geological model of combined Berkine and northern part of Illizi basins covers approx. 600x450 km<sup>2</sup>. The work included modeling the heat flow history throughout the region, the evolution of the drainage areas through time, the calculation of volumes of generated and expelled HC through time, and the fluid flow and migration of compositional HC along selected cross-sections. An extensive geochemical data base has been established for the two main source rocks of the area, the Silurian and Devonian hot shales, and a new thermal and maturity model has been elaborated emphasizing the role of the multiple erosion events and thermal events throughout the Phanerozoic. Migration along the three major carrier systems, the Triassic, Devonian and Ordovician sandstones is modeled under the influence of regional tectonics as well as taking into account local faulting.