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Surface and Subsurface Structural Expression of a Major Saharan Crustal Lineament: the Fadnoun Fault

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The southern Sahara of southeastern Algeria is dominated by roughly north-south trending structural elements. At the regional scale, these elements contribute to the definition of a series of similarly trending arches (i.e. Azzel-Matti, Idjerane, Amguid-El Biod, Tihemboka) and basins (i.e. Reggane, Ahnet-Timimoun, Mouydir, Illizi); at the local scale, they provide the foundation for numerous hydrocarbon traps along these arches and within the adjacent basins. The Fadnoun fault is a similarly trending (NNE), regional scale fault within the central Illizi basin and is associated with several hydrocarbon accumulations (e.g. Assekaikef, Bourarhet, El Abed Larache, Tiguentourine, La Reculee, In Amenas Ouest, Alrar, Stah). The network of faults that define the Fadnoun fault extends from outcrops in the Precambrian basement of the Hoggar Massif in the south to the subsurface of the northern Illizi basin some 400 km to the north. Surface and subsurface data document a long-lived structural history, with Precambrian origins and reactivation throughout the Phanerozoic. SPOT imagery data and limited fault-plane kinematic data argue for dominantly right-lateral strike-slip motion along its southern exposures in the Tassili, while late oblique or dip-slip motions dominate its northern subsurface expression in the Tiguentourine Field area, where 600 m of vertical offset occur.