# Integration of newly acquired aerogravity data in the exploration work of the Tinjar Province, onshore Sarawak

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The first commercial field in Sarawak, the Miri field was discovered in the onshore part of Sarawak in 1910. After this discovery further exploration work on the onshore area was hampered by no other significant or commercial discovery despite extensive drilling. These exploration activities in the Sarawak onshore area were concentrated in the north-eastern and south-western parts.

In the north-central part of the Sarawak onshore (designated as the Tinjar Province) only a few wells were drilled with some oil and gas shows. For a total of 12 wells drilled in the area covering almost 16,000 km$^2$, the Tinjar Province is considered underexplored. One major reason that the area was excluded from the early days of exploration is that it was assumed to possess a shallow basement as result of active uplifting and erosion during Oligocene-Miocene time. Lack of sediment thickness and shallow burial were also considered as negative factors for hydrocarbon expulsion and migration in the province. However, this claim on shallow basement was not supported by any seismic, gravity or magnetic data.



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In late 1996 a PMU/PRSS team began a study of the hydrocarbon potential of the Tinjar Province. Based on fieldwork, interpretation and review of SAR and the existing geological data, the study concluded that the area has potential for hydrocarbon entrapment, which warrants further investigation. As a continuation from the study a gravity survey was proposed to further explore the area and to determine depth to the basement.

In 1998 a total of 4653-line km of new aerogravity and magnetic data were acquired over the Tinjar Province. The data were later merged and processed with the previously acquired data in the adjacent areas (to the east a total 3,080 km of gravity and magnetic data acquired by OPIC in 1990, and to the west a total of 3,224 km of gravity data acquired by Idemitsu in 1991). Combined, this information provides a good coverage of gravity data over the Sarawak onshore area. Marine gravity results over the Balingian province were also integrated to provide an analogue to the onshore data interpretation.

The data was processed and interpreted and the results showed fairly good sediment thickness of up to 5,000 m in the Tinjar Province and the surrounding area. The gravity data detected and defined a series of highs and lows trends, major faults and other elements of the basement that can create structural and stratigraphic traps in the overlying Oligocene-mid Miocene clastics. The location, areal extent and sources of density contrasts causing residual gravity anomalies were also identified. A series of structural highs and gentle folds associated with thrusted basements are excellent targets for hydrocarbon accumulations. The shore-parallel striking, wide zone of steep gravity gradient between basement highs in the Tinjar Province and the deep depocenter of the Balingian basin should provide excellent stratigraphic traps. In general, the gravity data acquired recently provide a guide in delineating areas for future exploration activity in the north-central part of the Sarawak onshore.