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## Magnetic basement and its petroleum geological significance in Sichuan Basin

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S ichuan Basin is the basin with the largest number of proven gas reserves in China. The study of basement structure of the basin is very important in the deep oil and gas exploration. The research concerned on the structure of Sichuan basin's basement based on aeromagnetic data. We improved the method of determining the residual magnetization direction by the maximum cross-correlation method based on the vertical gradient and the total gradient of the magnetic anomaly. This reduction to the pole (RTP) method of magnetic anomalies considering the residual magnetization direction makes the result more reliable. We obtained residual basement magnetic anomaly (RBMA) from aeromagnetic data, then inverted the undulating magnetic basement and its susceptibility distribution, divided the magnetic basement of Sichuan Basin into 7 parts and discussed the controlling effect of Sichuan basin's magnetic basement on oil and gas migration and accumulation. Besides, the basement faults system was patterned with the help of the directional derivative, vertical derivative and horizontal gradient of the RBMA. The magnetic basement obtained in this paper is the top interface of lower mesoproterozoic with a depth of 3~10 km, which reflects the tectonic morphology and undulating characteristics of the deep metamorphic crystalline basement in the basin. The large inherited paleo-uplift developed on the magnetic basement depth of about 3~6 km. Luzhou paleo-uplift inherited paleo-uplift with 3.5~5.8 km magnetic basemen depth; the gas layer is the Jialing River group of lower Triassic.

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