

STT054-P01

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Magnetic constraints on the shallow subsurface structure of the Fukui Plain

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The Geological Survey of Japan (GSJ) conducted a helicopter-borne high-resolution aeromagnetic survey over the Fukui Plain, central Japan, to better understand concealed faults associated with the 1948 Fukui Earthquake (June 28, 1948, $M_j = 7.1$) that caused tremendous damage to this area. The survey was flown with a Cesium vapor magnetometer and a differential GPS along east-west and N10W flight lines at an altitude of 150m above terrain and spaced 300m and 3,000 m apart, respectively. The observed magnetic data have been processed and total magnetic intensity anomalies were compiled on a smoothed observed surface. The reduction to the pole anomalies were also calculated from the total magnetic intensity anomalies on the surface. Next, 3-D magnetic imaging has been applied to the magnetic anomalies to better understand the subsurface structure of the area. The characteristics of the results of the imaging are summarized as follows:

(1) Magnetization highs of 2.0 A/m lie south of the Awara Hot Spring in the western part of the plain, implying the existence of a past volcanic center and/or intrusions associated with the hot spring.

(2) A broad high-magnetization area which includes the local highs south of the Awara Hot Spring occupies the western part of the plain, suggesting buried volcanic rocks trapped inside the Neogene basin inferred from seismic and gravity surveys.

(3) The broad high-magnetization area is bounded by the Fukui Earthquake Fault to the east. Whereas, magnetization lows are dominant in the eastern part of the plain.

(4) Negative magnetizations are dominant along the coastline of the Sea of Japan north of the Kaetsu Plateau, suggesting the existence of reversely magnetized volcanic rocks which may outcrop along the coastline.

(5) On the basis of these results, it is suggested that the 1948 Fukui Earthquake occurred along the boundary of the old basement structure.

Keywords: aeromagnetic survey, high-resolution aeromagnetic survey, magnetic anomaly, magnetic structure, Fukui Plain, Fukui earthquake faults