

Bouguer gravity anomaly related to Cretaceous volcanic rocks in the Yanahara area, Okayama prefecture, SW Japan

ISHIKAWA, Nobuyo^{1*} ; KOMURO, Hiroaki¹ ; YAMAMOTO, Akihiko²

¹Dept. of Geoscience, Shimane Univ., ²Dept. of Earth's Evolution Environment, Division of Mathematics, Physics, Earth Science, Ehime Univ.

Cretaceous volcanic rocks (volcanic, pyroclastic and lesser sedimentary rocks) unconformably overlying the basement rocks composed of the Maizuru Group and the Yakuno complex are widely distributed in the region from Okayama to Hyogo Prefectures, central Chugoku, SW Japan. Remarkable low gravity anomalous areas observed in the region of these volcanic rocks suggest some cauldrons. Total 610 observation points including 411 new points and 199 published points (GSJ, 2000; Shichi and Yamamoto, 2001) depict a detailed Bouguer gravity anomaly map of the Yanahara district through the band-pass filter between 1 to 30 km after the terrane and Bouguer corrections with a density of 2670kg/m³.

The Bouguer gravity anomaly map reveals low gravity anomalous areas corresponding with the Cretaceous volcanic rocks and the related granitic intrusive rocks; whereas high gravity anomalous areas corresponding with the Maizuru Group and the Yakuno complex.

The low gravity anomalous areas of the Yanahara district are observed in two parts: western and northeastern areas. The western low gravity anomalous area, measuring 20×7km in size, shows a flat-floor type anomaly surrounded with high gradient margins. The relative anomaly value is 8mgal less than that of the peripheral area. This suggests a flat-floor caldera (cauldron) filled up with thick rhyolitic volcanic rocks. This inferred caldera was possibly produced 80Ma, because quartz diorite intruded into this caldera has been dated as 79.8±1.8Ma by biotite K-Ar method.

Another area northeast of Yanahara shows an elongated funnel floor surrounded with high gradient margin. The anomaly value is 7mgal less than that of the peripheral area. This value is nearly equivalent to the gravity anomaly in the above mentioned western area. Accordingly, another lesser cauldron possibly lies in this area.