Gravity survey at the extension of the Takahama fault and the Yokosuka fault in Nishio City, Aichi Prefecture

*Tokunosuke Tatsuzawa[1,2], Tatsuya Sumita[2], Shinobu Ito[2], Tomoya Abe[2]

1. Department of Earth Sciences, Resources and Environmental Engineering, Creative Science and Engineering, Faculty of Science and Engineering, Waseda University, 2. National Institute of Advanced Industrial Science and Technology

We conducted a gravity survey in Nishio city, Aichi Prefecture to clarify the subsurface structure related to the Takahama fault and the Yokosuka fault (Fig.1). Seismic reflection survey was held in that area in September 2018 (Ito, 2019) and the velocity structure was also obtained by refraction analysis. Then, we consider that we can clarify more detailed subsurface structure by conducting gravity survey on the seismic survey lines and their extensions (Line1 and Line2) and also by comparing gravity survey results with the seismic survey results. We also conducted gravity survey along the Yahagi Furukawa river (Line 3) that is supposed to cross the northern extension of the Yokosuka fault in the active fault map “Gamagori” (Okada et al., 2004) issued by Geospatial Information Authority of Japan and that is also crossing the concealed fault inferred by Sugito and Okada(2004).
In this survey, a total of 150 points of relative gravity was measured by the Lacoste D-type gravimeter (D68) and the Lacoste G-type gravimeter (G304). Measurement distance intervals were about 50m or 100m on Line1 and Line 2, about 30m or 50m on Line 3. The location coordinates of each gravity measurement point were mainly measured by GNSS(network type RTK-VRS), while some points were also measured by Total Station. Gravity anomaly was calculated by the standard procedure SPECG1988 (GSJ Gravity Survey Group, 1989). We performed terrain correction with 50m mesh DEM (Murata et al., 1996) for the Bouguer anomaly calculation. The contribution of terrain on gravity anomaly is small because the surveyed area is nearly flat. In fact, the maximum difference between simple Bouguer anomaly and the Bouguer anomaly calculated with 50m mesh DEM is 0.074mGal, and the pattern of the anomaly profile does not differ greatly between them.
As a result of gravity survey, the pattern of the Bouguer anomaly profile on Line1 and Line 2 is well related to the contour line of 3000m/s in P wave velocity section by the refraction analysis. On Line3, the Bouguer anomaly shows significant change around the point where the presence of the concealed fault of the Yokosuka fault was estimated (Sugito and Okada, 2004; Imaizumi et al., 2018). In addition, the Bouguer anomaly shows complex change on the eastern part of Line 2, where the P wave velocity is also lower than surrounding area by the result of the refraction analysis. In the coming months, we are going to make the density structure model by using the reflection boundary of the seismic profile and the gravity anomaly to reveal the details.

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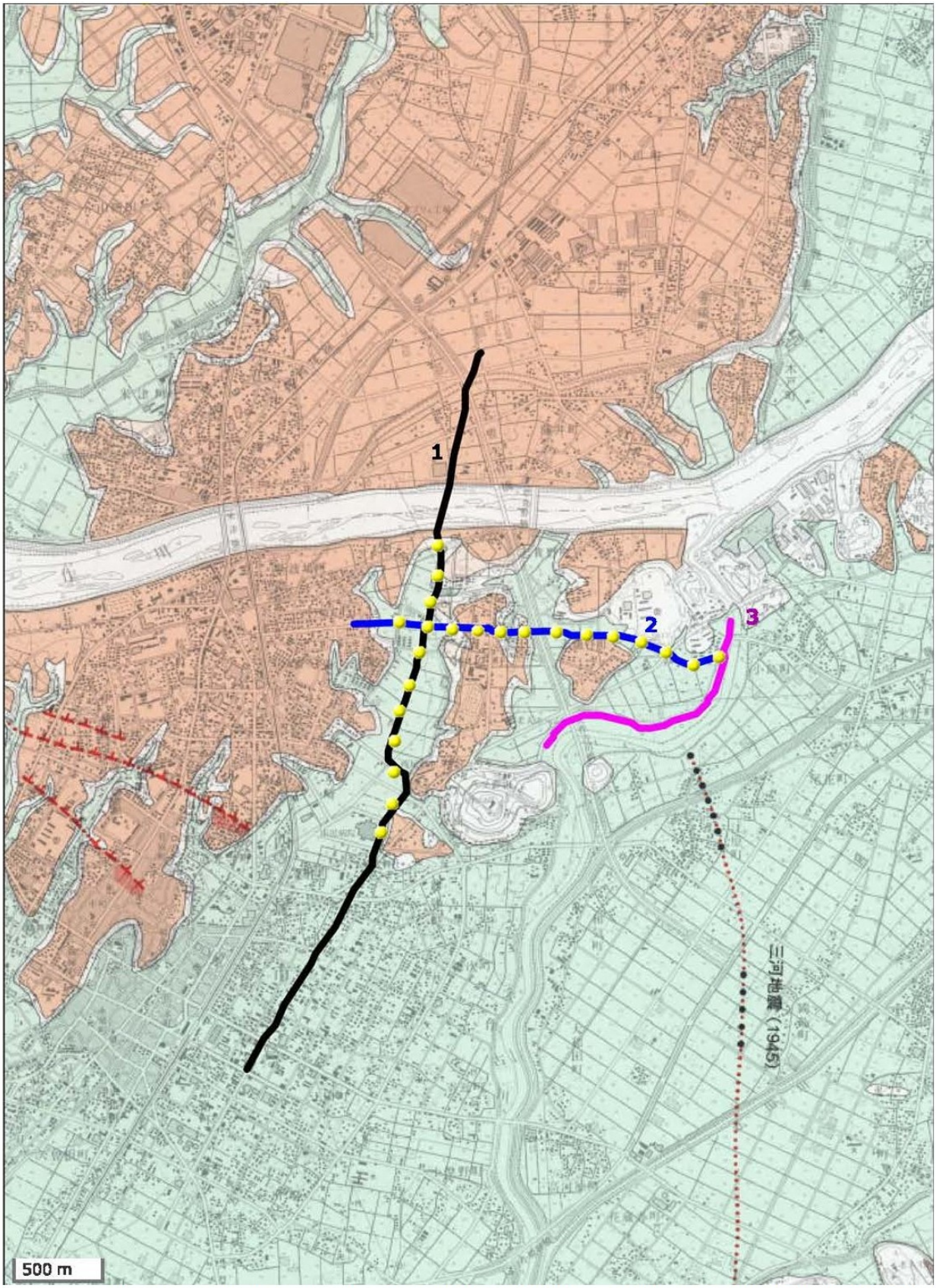

図1　愛知県西尾市における重力探査測線。都市圏活断層図「蒲郡」（岡田ほか、2004）をもとに加工して作成。
黒線が測線1、青線が測線2、紫線が測線3、を示す。測線1及び測線2の一部では反射法地震探査（2019、伊藤）が実施された。黄点線はその地震探査測線を示す。赤線は活断層、赤点は活断層(伏在部)、黒点は地震断層を示す。

