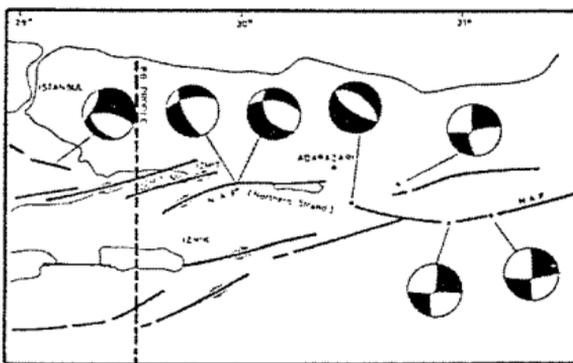


# STRUCTURE OF IZMIT BAY (THE EASTERN MARMARA SEA)

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As a result of the collision of the Arabian and Anatolian land masses during the middle Miocene, westerly escape of the Anatolian block introduced E-W compression in the western Turkey, which began to be relieved by N-S extension. The Izmit Bay lies along the line of North Anatolian Fault (NAF) which loses its dextral strike-slip displacement from East to West, and it splits into several fault strands defining a broad tectonic zone with associated high swarmlike seismic activity. As the Anatolian block moves west, its leading edge comes under the influence of the Aegean North-South extension and breaks up into discrete graben structures. The westward motion of the Anatolian block is not responsible for the extensional tectonic processes in the Aegean region which was existed before the initiation of NAF. There is major internal deformation within Anatolia, possibly involving counter clockwise rotational movements. Estimates of the average amount of North-South extension over the past 12-13 Ma are in between 30 to 50 percent in the region. The Marmara basin is the extension of the Thrace basin in the North and Northwest. During the middle Eocene, the subsidence of basement was occurred creating the Thrace basin and the NAF uses the older tectonic structures in this region. According to the gravity interpretation there is a relative crustal thinning under the sea of Marmara. Zero contour of the Bouguer gravity anomaly follows the trend of the NAF zone but this trend bends to the NE-SW direction just before the Izmit Bay. The north of the NAF zone and its splay areas have positive Bouguer gravity values reaching up to 50-55 Mgals levels towards the Black sea coast. Moho gets shallower towards the Black sea from 25-30 km to 20 km. The Izmit Bay area has a localized gravity minimum due to sedimentary fill of about 3-4 km. The grabens around the sea of Marmara (Izmit, Iznik and Gemlik Bays, Yeniflehir-Bursa-Manyas) lie along the course of N and S strands of the NAF, have very strong strike-slip components. The Izmit Bay area is just located the at the eastern edge of the Marmara basin and it is stil under the strong influence of the dextral strike-slip fault with the tensional regime of the sea of Marmara and the western Turkey. In the Izmit Bay area the NAF has a pull-apart structure. From the geometry of the basin about 8 km right-lateral displacement can be deduced. The NAF must have used the weakness points in the sea of Marmara (i.e. the Thrace extensional Basin) which should have active before the Middle Eocene, with additional effects of counter clockwise rotations of blocks in the western Turkey and the Aegean sea. Active tectonics of both strike-slip and normal faults effect the recent sedimentary facies in the Izmit Bay. These will be documented from the high resolution seismic investigations in the region within the context of of the general tectonic regime of the region where the even the very recent sedimentary sequences are affected by the transform and growth faultss which are still active.



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Fig. 1. Structural framework of the Izmit Bay area.

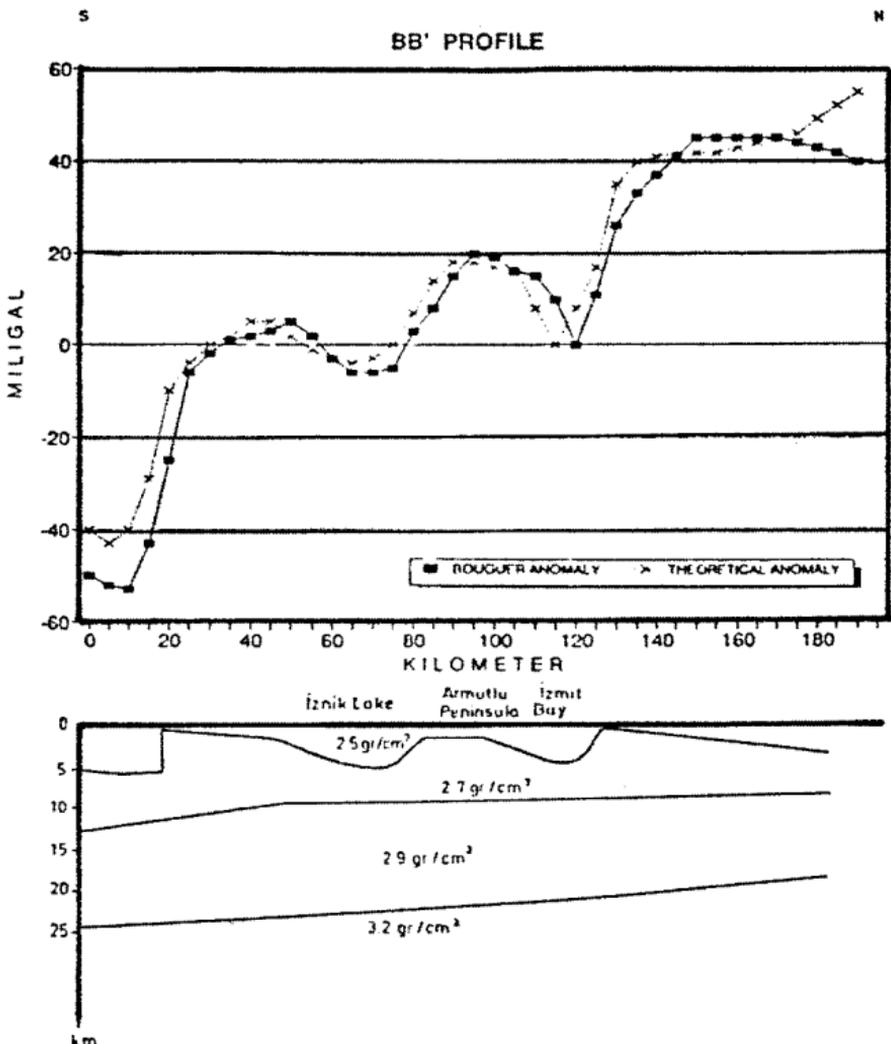


Fig. 2. Interpretation of the N-S Bouguergravity profile.