
INTERPRETATION OF MAGNETIC DATA OF THE BLACK SEA USING ANALYTIC SIGNAL METHODS

H. E. Tütünsatar¹, E. Erbek¹ M.N. Dolmaz¹
¹*Süleyman Demirel Üniversitesi, Isparta, Turkey*

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The Black Sea formed as a result of the tectonic evolution of Alpine Himalayan Belt is an elliptical Basin and located among Caucasus and Crimean in the north and Pontides in the south. The Black Sea Basin is separated by the mid-Black Sea Ridge-a NW trending basement uplift that causes two deep expansion sub-basins (the West Black Sea Basin and the East Black Sea Basin).

Determination the depth and location of a magnetic source is a necessarily process in geophysical applications. One of these methods is Analytic Signal based on the horizontal and vertical derivatives of the potential field data to delineate the depths and boundaries of sources having magnetic properties. In recent years, Horizontal Gradient Analytic Signal method was developed from Analytic Signal method. In this study methods of Analytic Signal (AS) and Horizontal Gradient Analytic Signal (HGAS) were applied to magnetic data of the Black Sea. Reduced to pole (RTP) data was preferred for a better result. 2 km and 1 km downward continuation was applied to the RTP data and AS and HGAS was calculated respectively. We observed that noise affects the results at 2km. The high intensity of magnetic signature of major tectonic elements are observed on Odessa Shelf and Karkinit Trough, which are causative sources in the Precambrian basement of the East European Craton, in the northeast of the Black Sea. From the mid to northern westward of Black Sea, remarkable signs coincide with the Sorokin trough, Tuapse trough, and Shatsky Ridge respectively. Moreover Southern offshore consisting of late Eocene detachment with buried Sea Mount and Sinop trough are distinguished efficaciously in the south of the Black Sea. However, any magnetic signs are not detected in the deep East and West Black Sea Basins on account of thick sedimentary deposits.