Introduction

The continuous subduction along the northern margin of the Paleo-Tethyan Ocean from Paleozoic to late Triassic and the Neo-Tethyan Ocean from Mesozoic to Cenozoic time emplaced several discontinuous ophiolite belts, long magmatic arcs as well as created intracontinental basins (e.g. stampfl and Borel, 2002). Geological field mapping has no other means to identify the location of the sutures and magmatic belts below e.g. sediment cover or different phase of magmatism. Magnetic mapping is the cheapest and fast solution to map region and can provide the required knowledge. The sutures include ophiolites. The ophiolites and corresponding magmatic rocks are highly magnetized (Clark and Emerson, 1991; Hunt et al 1995), thus allowing magnetic methods modelling and imaging ophiolite and magmatic bodies.

Negligible susceptibility value of sediments cause the high susceptibility contrast at basement-sediment boundary, which makes evaluating of magnetic basement topography possible by using radially average power spectrum of magnetic data (e.g. Maus et al 1997). The depth to the magnetic basement is assumed to serve as a proxy for the shape of sediments basins under the assumption that igneous basement is strongly magnetized relative to the overlying sediments with low susceptibility value and there is no interbedded magnetic layer in the sediments. Vertically averaged crustal susceptibility is calculated from magnetic data based on a newly developed method (Teknik and Ghods 2017; Teknik et al 2019).

The method are applied on the amalgamation structures in Anatolia. Identification of the highly magnetized bodies and shape of sedimentary basins, will allow us to trace features related to the tectonic sutures and hidden magmatic arc across the whole study area. The results will have significant importance for future more detailed studies and it has first order importance for the identification of potential hydrocarbon and mineral resources.

Fig 1: Magnetic susceptibility ranges of different rock types (After Clark and Emerson, 1991; Hans Thybo et al, 1995). Mafic and ultramafic rocks have the highest susceptibilities while metamorphic and sedimentary rocks have the lowest susceptibilities.