Reply by Stegena, Horváth and Ádám

It was not the premise of our article[1] that in platform areas only isotropic magnetotelluric (MT) curves can be measured. Our chief point was that the regional MT anisotropy (in which the same characteristics are exhibited at many points over a large area) is due to the deep structure of the region. The plate margins are an example of such a region having linear structures at depth. We presented two areas which lie on plate margins and which demonstrated regional anisotropy. According to more recent investigations[2], the Baikal rift, lying at an accreting plate margin, also shows regional anisotropy (Fig. 1).

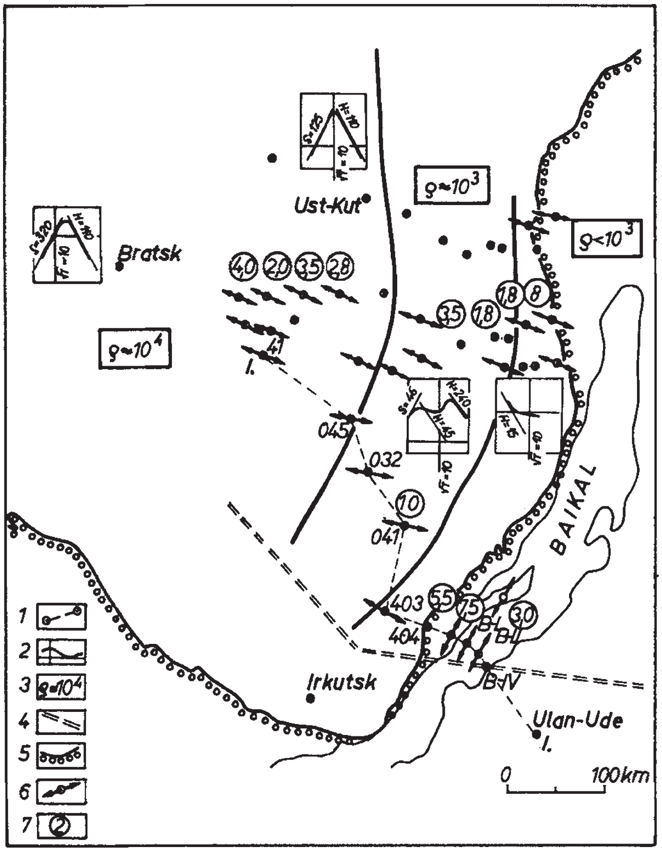

Fig. 1 Results of the magnetotelluric sounding in the Baikal rift zone (after Pospeev). 1, Loci of magnetotelluric sounding (MTS); 2, MTS curve characteristic to the given region; 3, specific resistivity of the basement; 4, DSS profile; 5, Precambrian rocks on the surface; 6, direction of major axis of MTS anisotropy ellipse; 7, value of ρ_{max}/ρ_{min} at $T=100$ s.

Several isotropic MT curves have been published from West Canada by Vozoff and Ellis and by Caner *et al.*[3]. Of five curves published by Caner *et al.*, one (Fernie) exhibits a definite and two others (Grand Forks, Osoyoos) a slight anisotropy. Recently the presence of MT anisotropy over a larger area ($\Delta\varphi=52°-55°$, $\Delta\lambda=111°-118°$) at Edmonton has been demonstrated by Reddy[4], the maximum of the specific resistivity tensor being directed to the north-west over a large area. The regional anisotropy is produced by a regional deep structure[4], perhaps connected with the palaeospreading of the Rocky Mountains[5]. In this case, however, the remaining two, definitely isotropic curves (Pincher and Penticon) of Caner *et al.* are yet to be explained.

In Fig. 2 the directions of ρ_{max} are shown for five MT curves measured in the area of the Wisconsin Arch[6] (Fig. 7 of ref. 6) and for four MT curves measured in west Australia (Fig. 5 of ref. 7). In both areas the scattering of the main directions of anisotropy indicates local sources, and thus this is not regional MT anisotropy in the sense described here.

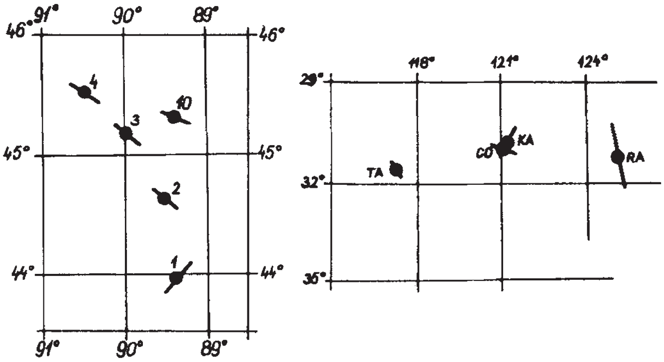

Fig. 2 Direction of ρ_{max}, computed from magnetotelluric measurements, in the area of Wisconsin Arch (left) and south-west Australia (right), according to Dowling and to Everett and Hyndman, respectively.

The local sources arise from faults due to the ancient tectonization of platforms[8].

It is well known that magnetotelluric anisotropy may be produced by inhomogeneities near the surface. Spreading tectonics also leads to near-surface effects, but "long linear structures connected with the ocean floor spreading are regional features"[1].

To summarize[1,2], anisotropy in which the sounding curves have the same character at many points in a large area is the result of the deep regional structure.

L. Stegena
F. Horváth
A. Ádám

Geophysical Institute,
Eötvös University,
Budapest

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