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On the distribution of the electrical conductivity in the area of the Chiemgau (northern Calcareous Alps) and below the Eastern Alps

In the last years magnetotelluric measurements and geomagnetic depth sounding have been done along a profile Chiemsee - Hohe Tauern/Zillertaler Alpen - Drautal. In autumn 1976 further geomagnetic depth sounding has been done along an EW-profile Zell am See - Ennstal - Leoben - frontier Austria/Hungary (south of Sopron). From these registrations the distribution of rocks of different electrical conductivity in the uppermost 100 km may be deduced.

The results of magnetotellurics along the first profile across the morphological boundary of the Alps (Chiemsee - Tal der Tiroler Ache - Reit im Winkl) have been confirmed by new results from a profile, which is situated about 10 km further to the east: In the area of the Chiemgau the Calcareous Alps are underlain by well conducting sediments until about 10 km south of the morphological border of the Alps. The well conducting sediments below the Calcareous Alps are thicker (ca. 5 km) than the Calcareous Alps themselves (ca. 1 - 2 km). The thickness of the well conducting sediments (more exact: the integrated electrical conductivity) decreases within a short distance at the supposed southern border of the molasse basin. As confirmed by new borehole logging the tertiary and the mesocoic sediments in the molasse basin are well conducting.

In a special field program the strong distortion of the induced electric field in the Calcareous Alps has been investigated. This distortion is caused by the inhomogeneity of the electrical conductivity near the earth surface. The effect of field distortion has been eliminated as far as possible in the measurements along the profiles.

The amplitude of the geomagnetic variations is rather constant in the Eastern Alps. The vertical component Z of the variations is small in a wide period range. The amplitude of the horizontal components is somewhat increased in the area of the Hohe Tauern. Below the Eastern Alps no distinct anomaly of the electrical conductivity exists.