Geophysical Research Abstracts
Vol. 15, EGU2013-7688, 2013
EGU General Assembly 2013

Relations between heat flow, topography and Moho depth for Europe

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The relation between heat flow, topography and Moho depth for recent maps of Europe is presented. New heat flow map of Europe (Majorowicz and Wybraniec, 2010) is based on updated database of uncorrected heat flow values to which paleoclimatic correction is applied across the continental Europe. Correction is depth dependent due to a diffusive thermal transfer of the surface temperature forcing of which glacial–interglacial history has the largest impact. This explains some very low uncorrected heat flow values 20–30 mW/m^2 in the shields, shallow basin areas of the cratons, and in other areas including orogenic belts were heat flow was likely underestimated. New integrated map of the European Moho depth (Grad et al., 2009) is the first high resolution digital map for European plate understand as an area from Ural Mountains in the east to mid-Atlantic ridge in the west, and Mediterranean Sea in the south to Spitsbergen and Barents Sea in Arctic in the north. For correlation we used: onshore heat flow density data with palaeoclimatic correction (5318 locations), topography map (30 x 30 arc seconds; Danielson and Gesch, 2011) and Moho map (longitude, latitude and Moho depth, each 0.1 degree). Analysis was done in areas where data from all three datasets were available. Continental Europe area could be divided into two large domains related with Precambrian East European craton and Palaeozoic Platform. Next two smaller areas correspond to Scandinavian Caledonides and Anatolia. Presented results show different correlations between Moho depth, elevation and heat flow for all discussed regions. For each region more detailed analysis of these relation in different elevation ranges is presented. In general it is observed that Moho depth is more significant to HF then elevation. Depending on region and elevation range HF value in mW/m^2 is up to two times larger than Moho depth in km, while HF relation to elevation varies much more.