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Interactive comment on "Crustal heat flow measurements in western Anatolia from borehole equilibrium temperatures" *by* K. Erkan

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In this study, I applied the traditional and discipline-standard procedures of the direct methods in crustal heat flow determinations (Beardsmore and Cull, 2001). The relatively shallow nature of the temperature logs may be questioned but this fact is reflected in the quality classes of the reported heat flow values in Table 1 (no Class A data, some class B data, and mostly class C and D data). The goal of the paper is to evaluate the new temperature-depth data, and present an interpretation for crustal heat flow based on what is available. It would be a starting point for future data collection to improve on the heat flow values, and more refined heat flow maps of the region.

Present study reports new heat flow values for the first time in the Aegean region using high resolution equilibrium temperature logs. A previous study for Marmara region

(Pfister et al., 1998; an international ISI publication) use the same type of shallow boreholes, same quality of thermal conductivity determinations, and basically have the same level of certainty in heat flow determinations. This study reports the results of a completely new campaign data in a different area with some overlap. Two studies are complementary in terms of data coverage (Figure 3).

Error analysis by quality classes as in this study has been used by the heat flow community since 70's (Lachenbruch and Sass, 1977; Pollack and Chapman, 1977; Balling et al., 1981; Blackwell et al., 1991). As discussed in Section 3, this is due to the major contributions of site-specific physical conditions such as measurement depth, intra-borehole fluid activity, quality of thermal conductivity data, etc., to the final quality of heat flow determination. Such approach may be found in other disciplines of geophysics. For example, in teleseismic studies event locations (epicenter/hypocenters) are frequently given as quality classes (e.g., Turkelli et al., 2003; Akyol et al., 2006).

For volcanics, thermal conductivity is known to get higher with age due to hydrothermal alteration. Accordingly, andesite in Alacaatli is Miocene age whereas andesite in K.Belen is Plio-quaternary age which leads to differences in thermal conductivity estimates for these two sites. Andesite thermal conductivities were assigned based on the study of Balkan et al. (2014), which includes 16 andesite samples collected from different locations in Turkey. Blackwell and Steele (1989) reports a range of 1.45-2.10 W/m/K for andesite, in agreement with the values in Table 1.

The comment on radioactivity in Section 6.3 is based on the general fact that rocks tend to contain similar proportions of the radioactive elements (Wollenberg and Smith, 1968, Table 1).

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