

GEOTHERMAL SESSIONS

Some Overlooked Errors in Thermal Conductivity Measurements

A. E. BECK

There are occasions when one requires the value of the thermal conductivity of a porous

rock saturated with fluids of thermal conductivity ranging from high to low. Many attempts have been made to obtain these values by measurement and by computation. Much of the data in the literature is inconsistent in that a mathematical or physical model developed by one author to explain the results of a particular set of experiments does not fit the results found by another author.

It is shown that much of this inconsistency can be removed if proper account is taken of some errors which are frequently, and reasonably, ignored for water-saturated rocks but become increasingly important for rocks saturated with low-conductivity fluids such as oil, air, or steam.

The experimental results are in reasonable agreement with a modified Maxwell model for thermal conductivity.