

INTERNAL LUNAR TEMPERATURE FROM TRANSIENT MAGNETIC FIELD MEASUREMENTS

by

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ABSTRACT

Apollo 12 magnetometer measurements of the lunar response to transient magnetic fields have been used to calculate the electrical conductivity and temperature of a three-layered model. Analysis of the eddy-current transient response when the magnetometer is on the dark side of the Moon indicates an outer layer of very low electrical conductivity, an intermediate layer of thickness $0.6 R_M$ to $0.95 R_M$ with conductivity $1.7 \pm 0.4 \times 10^{-4}$ mhos/meter, and an inner core between the center to $0.6 R_M$ with a minimum conductivity of 10^{-2} mhos/meter. Assuming an internal composition of peridotite, the temperatures of these layers are as follows: crust $< 540^\circ\text{K}$, intermediate layer 940°K , and core $\approx 1270^\circ\text{K}$.