SURFACE MAGNETOMETER EXPERIMENTS: INTERNAL LUNAR CONDUCTIVITY PROFILE AND STEADY FIELD MEASUREMENTS, P. Dyal*, C.W. Parkin**, and W.D. Daily*.
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Remanent magnetic fields have been measured at the Apollo 12, 14, 15, and 16 landing sites on the lunar surface. The field magnitudes vary from 4 gamma at the Apollo 15 site to a high of 313 gamma at the Apollo 16 Descartes site. Measurements indicate that the sources are local rather than global and that on the near earth hemisphere the highlands possess higher remanent fields than the maria regions. Simultaneous magnetometer and solar wind spectrometer measurements show that the remanent fields at the Apollo 12, 15, and 16 sites are compressed by the solar wind. In situ measurements of the magnetic remanence of sample 60335 permitted an upper limit to be placed on the soft perm of the material.

The global magnetic response of the Moon to solar and terrestrial fields has been measured simultaneously by the Apollo 15 and 16 magnetometers. Analyses of the poloidal field decay of the eddy currents has yielded a range of monotonic conductivity profiles for the lunar interior: the conductivity rises from 3×10^{-4} mhos/m at a depth of 170 km to 10^{-2} mhos/m at 1000 km depth. The solar wind confines the induced lunar poloidal field by compressing it to the surface on the lunar subsolar side and forming a cylindrical cavity on the lunar antisolar side. This confinement has been modeled in the laboratory by a magnetic dipole enclosed in a superconducting lead cylinder and the results compared to the lunar measurements.