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## Evidence for a Wet Martian Interior from Magnetic Sounding with the InSight Magnetometer

Yanan Yu<sup>1</sup>, Christopher Russell<sup>1</sup>, Matthew Fillingim<sup>2</sup>, and William Banerdt<sup>3</sup>

<sup>1</sup>University of California, Los Angeles, Institute of geophysics, Earth and Space Science, Los Angeles, United States of America (ctrussel@igpp.ucla.edu)

<sup>2</sup>Space Sciences Laboratory, University of California, Berkeley, CA 94720, USA

<sup>3</sup>Jet Propulsion Laboratory, NASA, Pasadena, CA, USA

The martian magnetic field oscillates at frequencies from once per day to periods of only 100s of seconds. The interior of Mars is electrically conducting, and the time-varying magnetic fields create induced currents in the electrically conducting subsurface of Mars. The diurnal periods are little affected by the interior conductivity, but at periods shorter than about 1000 sec, the reflection of the magnetic wave energy is strong, and the vertical component of the oscillating magnetic field approaches zero as the frequency increases. Electromagnetic waves at the shorter (<1000s) periods are produced by the nighttime currents such as those flowing on and within the Mars magnetotail. These fluctuations are weak in the vertical component of the waves associated with the restriction of the currents to flow horizontally as the wave period grows shorter. This phenomenon is also seen on Earth and has been well characterized there. The measure of the attenuation of the vertical component is referred to as the skin depth. The attenuation observed at the InSight landing site is consistent with a skin depth of 3.4 km for the expected conductivity of terrestrial seawater. We have not seen any variation of this skin depth with season. These observations are consistent with the many manifestations of the occasional presence of water on or near the surface of Mars and strengthen the case for permanent water in the soil only several kilometers beneath the surface.