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摘要: Recent studies of the minute morphology of the skin by optical coherence tomography showed that the sweat ducts in human skin become helically shaped tubes in the Epidermis and are filled with an aqueous solution. When considered as entities embedded in a dielectric media, they resemble helical antennas. The spectral response obtained by our computer simulations coincides with the analytical prediction of antenna theory and support this hypothesis, if a fast enough current mechanism exists in the duct. In particular the strongest spectral response of the simulation was noted around the predicted frequencies (240 GHz and 380 GHz) for the respective normal and axial modes of the helical structure. Furthermore, circular dichroism of the reflected electromagnetic field is a characteristic property of such helical antennas and it was shown that it is indeed a characteristic of the simulation model. Fast proton hopping is posited as the current mechanism.

Consequently experimental evidence is presented that the spectral response of the skin in the sub-Terahertz region is governed by the level of activity of the perspiration system. This in turn is moderated by the Sympathetic Nerve Response and is demonstrated by the correlation to physiological stress as manifested by the pulse rate and the systolic blood pressure. These physical relaxations are tonic in nature (lasting more than a minute). Could the phasic characteristic of emotional excitation also be evident in the reflection coefficient? By applying techniques borrowed from psychiatric science we hope to answer this point in our paper.

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