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<Poster presentation>

Skin depth profiling by using fiber optic probes in the near infrared

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Recently we showed the prototype portable device for the determination of human skin moisture by using near infrared spectroscopy. In order to optimize the acquiring condition of NIR spectrum of skin and control the target information of water depending the site such as epidermis and dermis, skin depth profiling was investigated changing the distance between illuminations and receiving of radiation in the terminal of fiber probe. The collected light information could be controlled by changing the distance of the fiber optic probes. It was confirmed that the longer distance we used, the deeper site from the skin surface we could get information from in this study. Four kinds of probes with distances such as 0.03 mm, 0.1 mm, 0.5 mm, and 1.0 mm were used. In addition, the gap size from 0.3 mm to 3.0 mm was studied to control the intensity of water absorbance effectively and to avoid saturation of water absorption. We also investigated the reference materials depending the reflectance ratio for water absorption not to be saturated because of the strong absorptivity of water. Furthermore, spectroscopic information regarding free water and bound water around 1850 nm was investigated by using the different distance of fiber optic probes. This study would be great help to control the spectroscopic information of water to be measured depending the site where water exists.

Keywords : near infrared (NIR), skin, depth profiling, free water, bound water