〈一般論文〉

独立成分分析法のシミ評価への応用

マイクロスコープ画像によるシミの面積と濃さの定量

沖 山 夏 子*，小山内　宰**，上 村 隆 明*
武内栄次郎*，南　　浩治*，小 島 伸 俊*，堀　　公彦*

Evaluation of Pigmentation in Human Skin Applying Independent Component Analysis

―Determination for Area and Density of Pigmentation Using Microscopic Images―

Natsuko OKIYAMA*, Osamu OSANAI**, Takaaki UEMURA*, Eijiro TAKEUCHI*,
Koji MINAMI*, Nobutoshi OJIMA*, Kimihiko HORI*

Abstract

　　We present a technique for determination of pigmentations in human skin using microscopic images applying independent component analysis (ICA). Conventionally, L* value (CIELAB) has been widely used for determination of pigmentation. However, redness of facial skin also causes a decrease of L* value. The technique using images applying ICA enables to quantify changes in pigmentation size by area and in depth by density of melanin respectively, without influence of redness.

　　In order to avoid distortion of skin which interferes accurate quantification of pigmentation areas, plate glass was applied at the open end of the probe of microscope. The digital images detected were analyzed by ICA, and melanin component of the images were obtained. After noise reduction process, the images of pigmentation were binalized to specify areas, followed by calculation of densities of melanin pigments. Results of determination for seasonal changes of pigmentations in 45 women's facial skin and changes in 60 women's facial skin under treatment with lightening essence of pigmentation are shown.

Key words:　image analysis, independent component analysis, melanin, pigmentation, microscope.