Study of Skin Phantoms by Photothermal Radiometry in the Frequency Domain and with Multivariate Methods

J.L. Pichardo-Molina,[1,C,S] G. Gutiérrez-Juárez,[2] H. Landa-Hernández,[2] R. Ivanov,[3] and O. Barbosa-García[1]

[1]*Centro de Investigaciones en Optica A. C., Lomas del Campestre, León, GT, México*
jpichardo@cio.mx

[2]*Instituto de Física, Universidad de Guanajuato, León, GT, México*

[3]*Facultad de Física, UAZ, Zacatecas, ZA, México*

In this paper, we report the study of pigmented gel phantoms and skin anomalies of pork by means of a photothermal radiometry technique and two multivariate methods, principal component analysis (PCA) and linear discriminant analysis (LDA). We show that when the samples have a difference in concentration of 0.007g/ml, we obtain a good discrimination: 100 % of the data are classified correctly using both multivariate methods. However, when the phantoms are prepared with a difference in concentration of 0.0025 g/ml, only LDA offers a good discrimination. For the case of skin anomalies of pork, we used only LDA for the identification of burned and unburned skin, obtaining an excellent identification of skin anomalies.