农产品组织中光输运规律的初步研究

Preliminary study of the light migration in farm product tissue

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英文关键词：photon migration rule; Monte Carlo method; nondestructive measuring method of the farm product

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中文摘要：

目前对农产品近红外无损检测中的光输运规律研究较少，该文主要从光的辐射传输方程出发，简析了基于该理论的几种相关模型及Monte Carlo(蒙特卡罗)仿真方法，讨论了各种模型适用条件和范围。应用Monte Carlo仿真方法，选择目前已知的肌肉组织光学参数进行了仿真计算，给出光源到检测距离与穿透深度的计算结果。研究表明，光传输理论和蒙特卡罗仿真方法在农产品无损检测领域将有良好的应用前景。

英文摘要：

Light migration in nondestructive detection of farm products by using near infrared spectroscopy was little investigated, the theory based on the radiative transfer equation, and several models of this theory and the Monte Carlo method were described in this paper. Moreover, the applicability of these models was also analyzed. Based on known tissue optical parameters, the relations between the detection depth and measuring distance, thickness of overlying tissue were discussed by using Monte Carlo. It showed that the radiative transfer equation and Monte Carlo method was very useful in the field of nondestructive detection of farm product.

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