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Ambiguity of mapping the relative phase of blood pulsations

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Abstract

©2014 Optical Society of America. Blood pulsation imaging (BPI) is a non-invasive optical method based on photoplethysmography (PPG). It is used for the visualization of changes in the spatial distribution of blood in the microvascular bed. BPI specifically allows measurements of the relative phase of blood pulsations and using it we detected a novel type of PPG fast waveforms, which were observable in limited areas with asynchronous regional blood supply. In all subjects studied, these fast waveforms coexisted with traditional slow waveforms of PPG. We are therefore presenting a novel lock-in image processing technique of blood pulsation imaging, which can be used for detailed temporal characterization of peripheral microcirculation.

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