



Laser speckle contrast imaging accurately measures blood flow over moving skin surfaces

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Titre	Laser speckle contrast imaging accurately measures blood flow over moving skin surfaces
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Auteur	Mahé, Guillaume [1], Rousseau, Pascal [2], Durand, Sylvain [3], Bricq, Stéphanie [4], Lefthériotis, Georges [5], Abraham, Pierre [6]
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Résumé en anglais	<p>Cutaneous blood flow (CBF) can be assessed non-invasively with lasers. Unfortunately, movement artefacts in the laser skin signal (LSsk) might sometimes compromise the interpretation of the data. To date, no method is available to remove movement artefacts point-by-point. Using a laser speckle contrast imager, we simultaneously recorded LSsk and the signal backscattered from an adjacent opaque surface (LSos). The completion of a first protocol allowed a definition of a simple equation to calculate the CBF from movement artefact-affected traces of LSsk and LSos. We then recorded LSsk and LSos before, during and for 5 min after the tourniquet ischemia, both when subjects ($n = 8$) were immobile or submitted to external passive movements of random intensity throughout the test. The typical post-occlusive reactive hyperemia trace was not identifiable within the LSsk recordings, with LSsk being 2 to 3 times higher during movements than in the immobile situation. After the calculation of CBF, traces in the immobile versus movement conditions were comparable, with the "r" cross-correlation coefficient being 0.930 ± 0.010. Our method might facilitate future investigations in microvascular physiology and pathophysiology, specifically in subjects who have frequent or continuous involuntary movements.</p>
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