Dynamic Light Scattering-Based Blood Flow Diagnosis at Broken Ergodicity Conditions

I Meglinski[1], A Sdobnov[2], V Kalchenko[3], and A Bykov[2]

[1] *College of Engineering and Physical Sciences, Aston University, Aston Triangle, Birmingham, UK. Contact Phone: +441212044329*
[2] *Optoelectronics and Measurement Techniques Unit, University of Oulu, Oulu, Finland*
[3] *Veterinary Resources, Weizmann Institute of Science, Rehovot, Israel*
Contact Email: i.meglinski@aston.ac.uk

The majority of biological tissues are the highly heterogeneous media composing a mixture of static and dynamic structural inclusions. The presence of static areas exhibits non-ergodic features providing systematic uncertainty in the quantitative interpretation of the measurements of dynamic light scattering (DLS). In fact, a number of various DLS-based techniques are extensively used for monitoring, imaging, and quantitative assessment of blood flows in biological tissues, whereas the issues associated with the non-ergodicity are typically ignored. Based on the simple phenomenological model, we present a justification for the applicability of DLS-based imaging technique for monitoring of blood flows within biological tissues under the formally broken ergodicity conditions [1,2]. In addition, we introduce a time-space Fourier Kappa-Omega filtering approach for stabilization of fast dynamic brain images *in vivo* as presented in Figure 1.

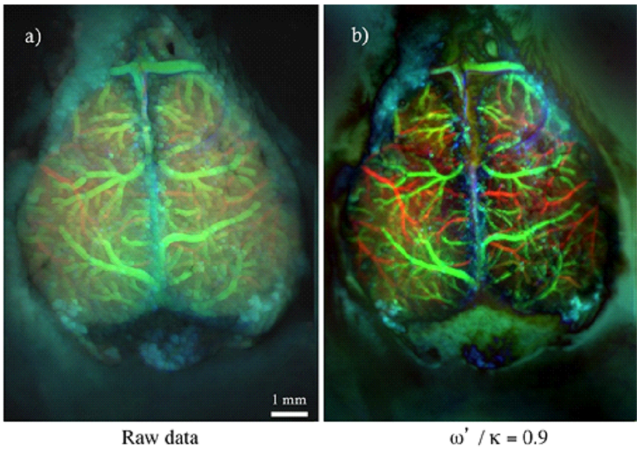

Figure 1: Brain images before (a) and after (b) the application of a time-space Fourier Kappa-Omega filtering approach [3]

References

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