

## Combined use of laser Doppler flowmetry and videocapillaroscopic methods for simultaneous assessment of rhythmic oscillations in blood microcirculation

I.O. Kozlov<sup>1</sup>, M.V. Volkov<sup>2</sup>, I.P. Gurov<sup>2</sup>, N.B. Margaryants<sup>2</sup>,  
A.V. Potemkin<sup>2</sup>, E.A. Zhrebtsov<sup>3</sup>, V.V. Dremine<sup>1</sup>, A.V. Dunaev<sup>1</sup>

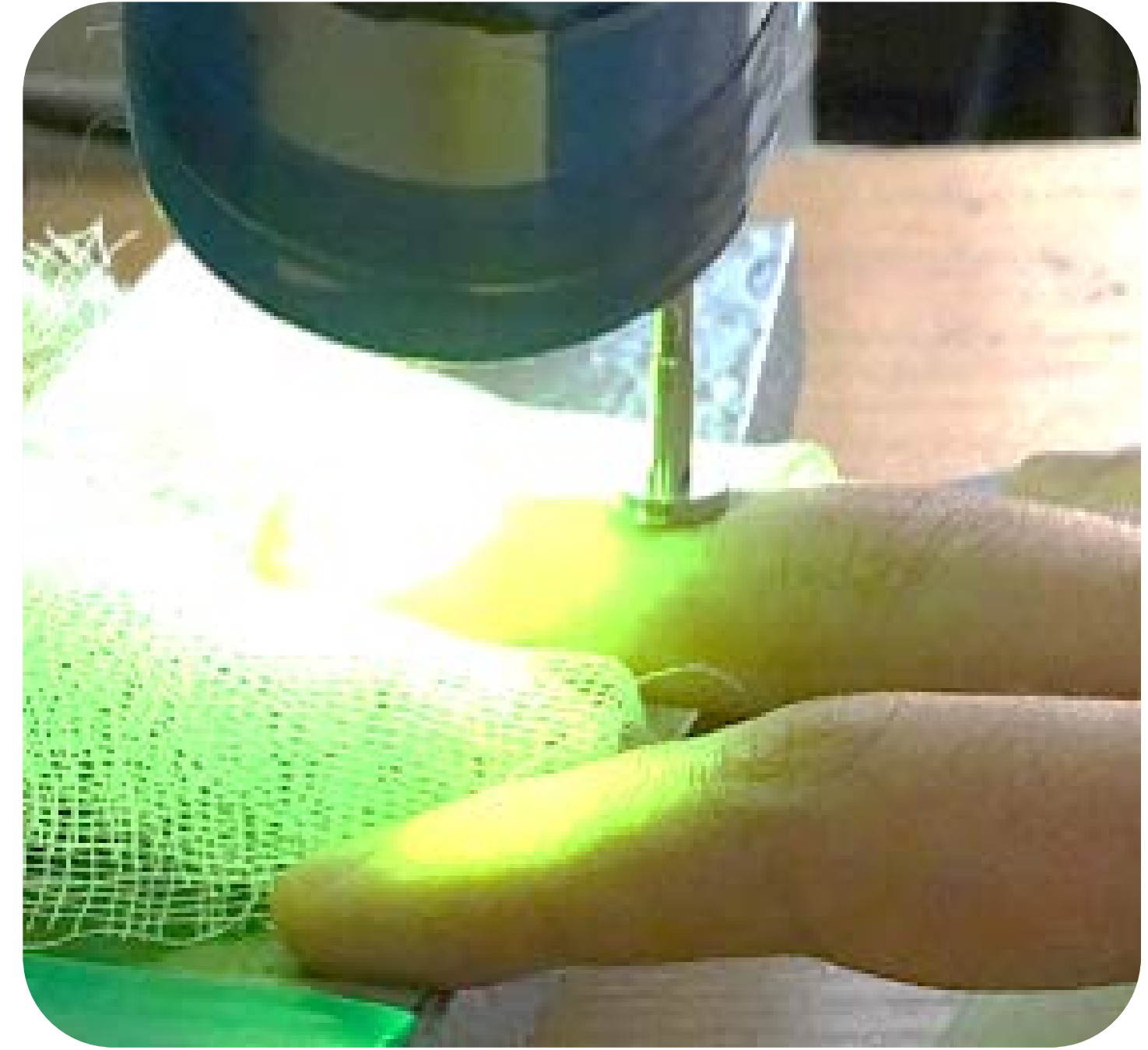
<sup>1</sup>Orel State University named after I.S. Turgenev, Orel, Russia

<sup>2</sup>ITMO University, Saint-Petersburg, Russia

<sup>3</sup>Aston University, Aston, UK

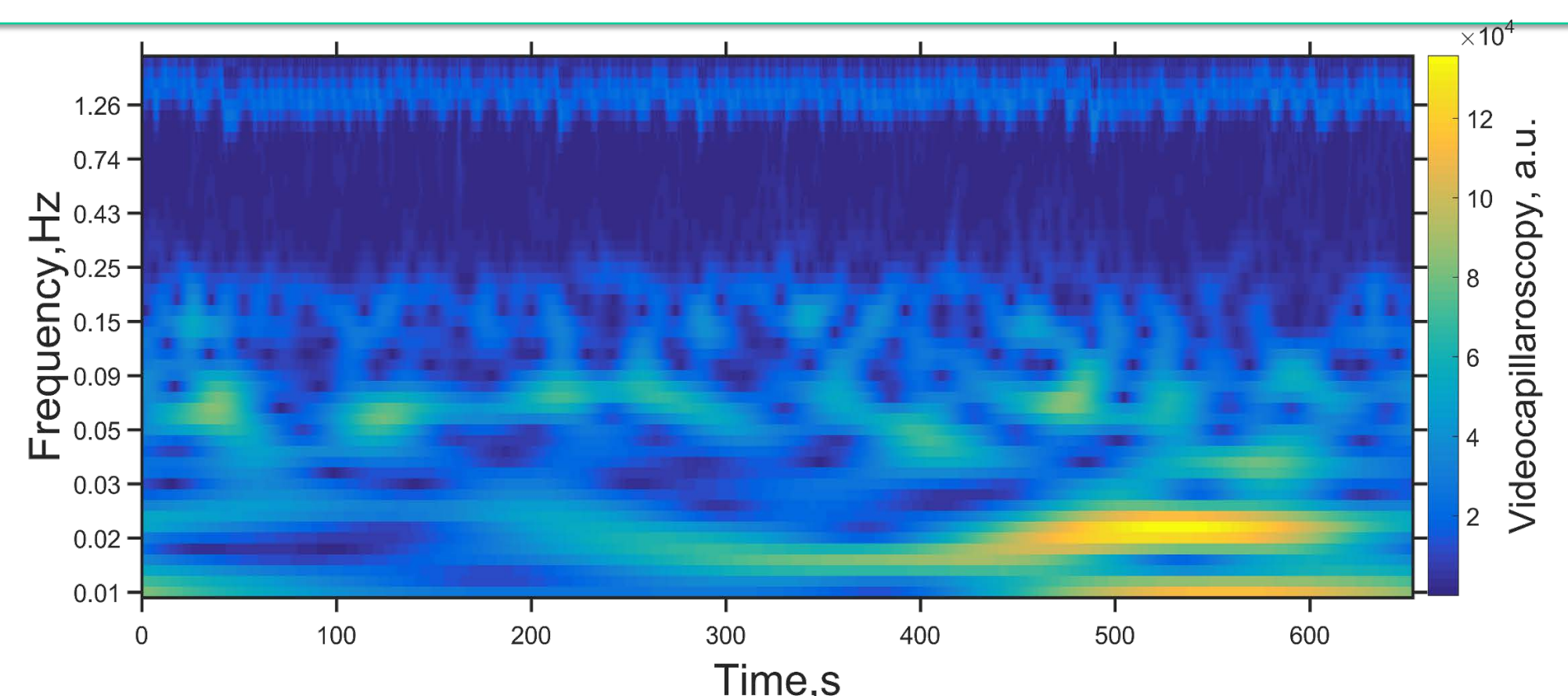
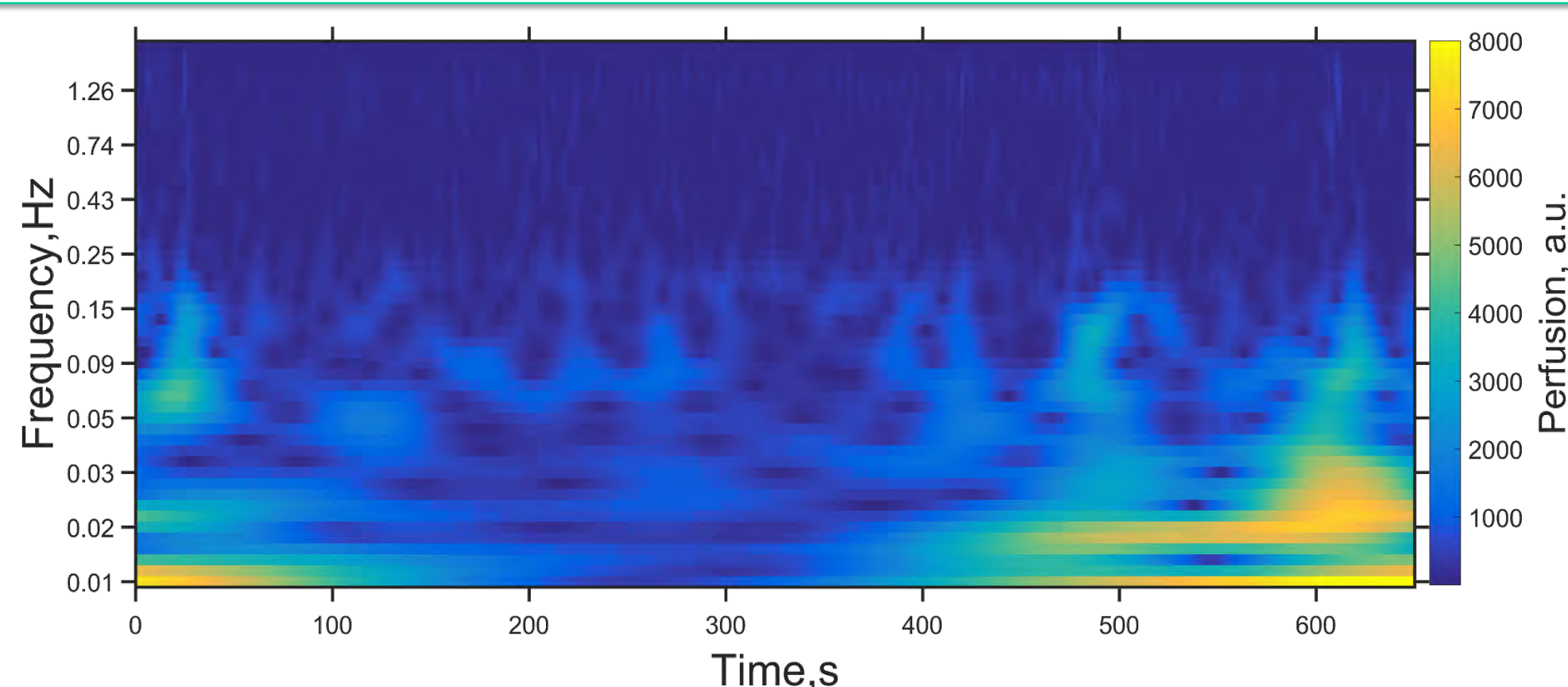
## Materials, Methods and Experiments

For this research to be conducted, the in-house made LDF device was used with appropriate algorithm for calculation of microcirculation index.



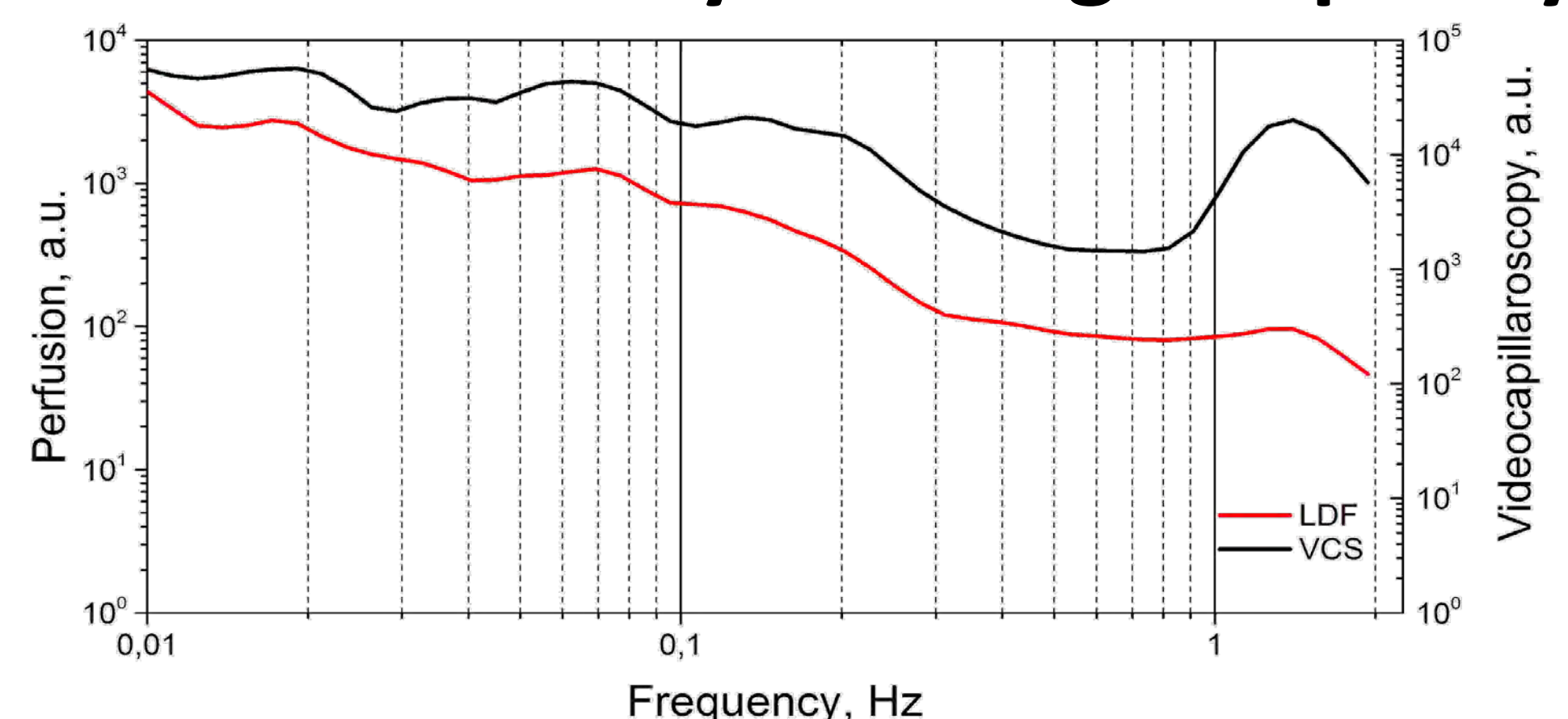
**The in-house custom build capillaroscopy and probe of laser Doppler flowmeter placed on middle finger**

The in-vivo and in-situ blood flow velocity measurements in a single capillary were implemented by the videocapillaroscopic method supported by advanced imaging processing algorithm. The in-house custom build setup consists of optical subsystem, high-speed IDS UI3060-CP camera and side illumination subsystem. In the system, the registered sequences of frames with a frame rate of 300 fps are processing by the novel dedicated algorithm.



## Wavelet-analysis of LDF-signal and graph of RBC-velocity in a single capillary

By the equipment simultaneous measurements of LDF-signal and video-frame sequences were conducted in the frame of an experimental series with 10 min basic test.



## Conclusion

The proposed approach demonstrated the essential correlation between spectra oscillations in the single capillary and the integral estimation of the microcirculation index by the laser Doppler flowmetry method. This result demonstrates the deep connection of the LDF signal with objective physical characteristics of the skin blood microflow.

## Averaged wavelet coefficient summa of LDF-signal and single capillary RBC-velocity in frequency domain

## Acknowledgements

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