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Aiming to the personalized Laser treatment of Vascular and Pigmented dermatology based on the Hybrid Laser Speckle and Hyperspectral Imaging**Bin Chen***Xi'an Jiaotong University, China*

Vascular and pigmented dermatoses will influence physical and psychological health of patients. Based on the selective photothermolysis, laser therapy has become the first choice of treatment. However, the total clearance rate is still lower than 20%, owing to the unclear mechanism of laser-tissue interaction and lack of detection technology of tissue structure. To simulate the heat transfer and thermal damage of hemoglobin and melanin induced by short pulse laser energy, non-equilibrium heat transfer model in skin tissue was constructed for vascular and pigmented dermatosis. Through the model, laser parameters were optimized, including wavelength, pulse duration and incident laser fluence. Together with Arrhenius integral, the thermal damage dynamics can be quantitatively evaluated. To validate the theoretical model, in vivo animal model was conducted based on dorsal skin model to visualize the dynamic response inside skin tissue including heat transfer and thermal injury. Non-destructive detection of skin tissue structure and concentration of chromophores (hemoglobin and melanin) were developed by hybrid laser speckle and hyperspectral imaging technology. Real-time feedback of the treatment effect for skin disease can be obtained, and personalized strategy for the laser treatment of vascular and pigmented dermatosis can be achieved.

Biography

Bin Chen has completed his PhD at the age of 31 years from Xi'an Jiaotong University and postdoctoral studies from Japan Society for Promotion Science. He is the vice director of State Key Laboratory of Multiphase Flow, a national innovation in China. He has published more than 100 papers in reputed journals and has been serving as an editorial board member of International Journal of Thermofluid Science and Technology.