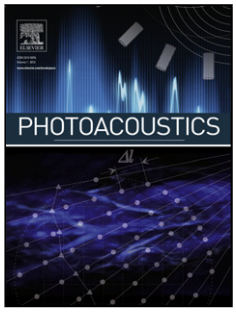

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Laser scanning laser diode photoacoustic microscopy system

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Abstract: The development of low-cost and fast photoacoustic microscopy systems enhances the clinical applicability of photoacoustic imaging systems. To this end, we present a laser scanning laser diode-based photoacoustic microscopy system. In this system, a 905 nm, 325 W maximum output peak power pulsed laser diode with 50 ns pulsewidth is utilized as the light source. A combination of aspheric and cylindrical lenses is used for collimation of the laser diode beam. Two galvanometer scanning mirrors steer the beam across a focusing aspheric lens. The lateral resolution of the system was measured to be ~ 21 µm using edge spread function estimation. No averaging was performed during data acquisition. The imaging speed is ~370 A-lines per second. Photoacoustic microscopy images of human hairs, *ex vivo* mouse ear, and *ex vivo* porcine ovary are presented to demonstrate the feasibility and potentials of the proposed system.

Keywords: Photoacoustic imaging; Diode lasers; Medical imaging; Biological imaging; Low-cost sources