**File S1**

**Equations describing heat transport during continuous-wave and pulsed laser illumination**

**Heat transport during continuous-wave and pulsed laser illumination**
The dynamics of the temperature distribution is described by the heat equation with external input:

$$\rho c_p \frac{\partial T}{\partial t} = \kappa \nabla^2 T + P$$

Where $\rho$ is the density, $c_p$ is the specific heat, $\kappa$ is the thermal conductivity, and $P(\mathbf{r},t)$ is the heat power deposited by the laser. Suppose $P=0$ outside a small radius $r_0$.
For **continuous-wave illumination** $P$ is constant. At steady-state (time derivative of temperature is zero) we have

$$T(r,t) = T_0 + \frac{P}{4\pi\kappa r}$$

for $r > r_0$. Therefore the laser-induced temperature shift decreases as the inverse of the radius from the center of the heated region.
For **pulsed illumination**, an infinitely small and short pulse of heat creates a thermal distribution described by the fundamental solution

$$T(r,t) = T_0 + \frac{E}{4\pi\rho c_p(\alpha t)^{3/2}} e^{-r^2/4\alpha t}$$

where

$$\alpha = \frac{\kappa}{\rho c_p}$$

is the thermal diffusivity and E is the total energy deposited by the pulse:

$$E = \int_{\text{pulse}} P dt$$

Therefore in pulsed illumination the laser-induced temperature shift decreases exponentially with the square of the distance to the heat source.