Supplementary Materials

Illumination by a Gaussian pulse in a Liquid media

At this point, we solve the heat equation which is given as follows:

$$C_{H_20}\frac{\partial T}{\partial t} = \nabla K_{H_20}\left(T\right)\nabla T + p_{abs}\left(z,t\right) \tag{S1}$$

where C and K are the heat capacity and the thermal conductivity of water, respectively. In Eq. (S1), pabs is the absorbed power density which is given as:

$$p_{abs} = \frac{\epsilon_0\epsilon''\left(\omega\right)\left|E_{abs}\right|^2}{2}f\left(x,t\right) \tag{S2a}$$

$$f(x,t) = exp(-\frac{x^2}{x_0^2})exp(-\frac{t^2}{t_0^2}) \tag{S2b}$$

In Eq. (S2), ϵ_0 represents the permittivity of the vacuum, E_{abs} is the magnitude of the absorbed electric field and ϵ'' is the imaginary part of the dielectric constant of H_2O at the central wavelength of the laser beam λ = 220 nm. In the case considered, assuming that x_0 = 100nm and t_0 = 0.1 ns, we represent in Figure S1 the variation of the temperature as a function of absorbed electric field and in Figure S2. the cross section of the temperature variation when E_{abs} = 0.5 GV/m. For completeness, we represent the real and the imaginary parts of the refractive index of H_20 in Figure S3. Finally, in Figure S4 we represent the spectral dependence of the penetration depth δ. It is given as:

$$\delta = \frac{\lambda}{4\pi k} \tag{3}$$

where λ is the wavelength of the incident laser beam and k is the imaginary part of the refractive index. The results are obtained according to [54]. Specifically, for λ = 220 nm the refractive index is $n = 1.3271 + 3.4154 \times 10^{-6}$, which leads to δ = 0.5 cm.

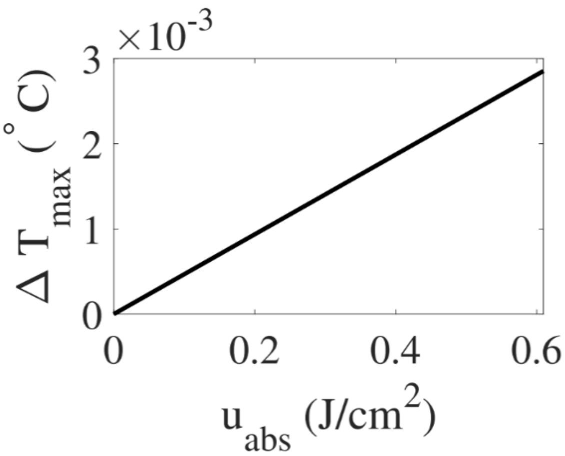

Figure S1. The maximal temperature variation ΔT_{max} as a function of absorbed energy density, u_{abs}.

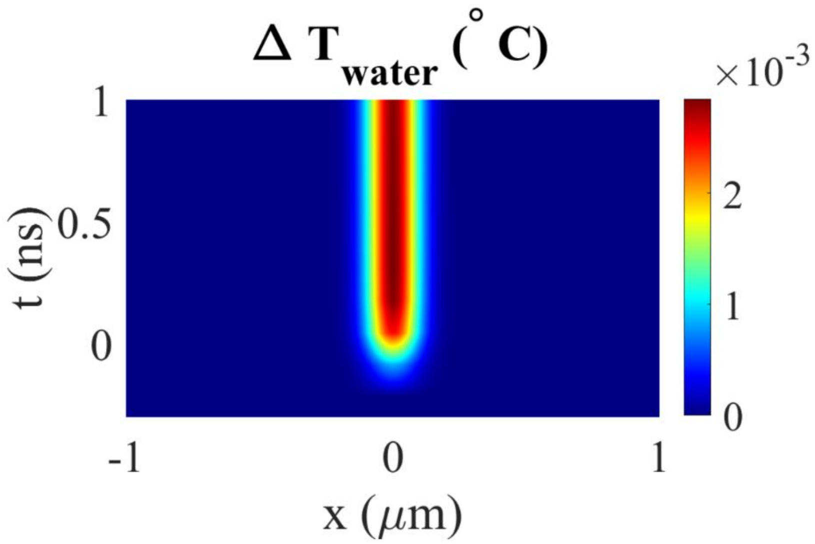

Figure S2. Spatio temporal dependence of ΔT_{max} when E_{abs} = 10 MV/m.

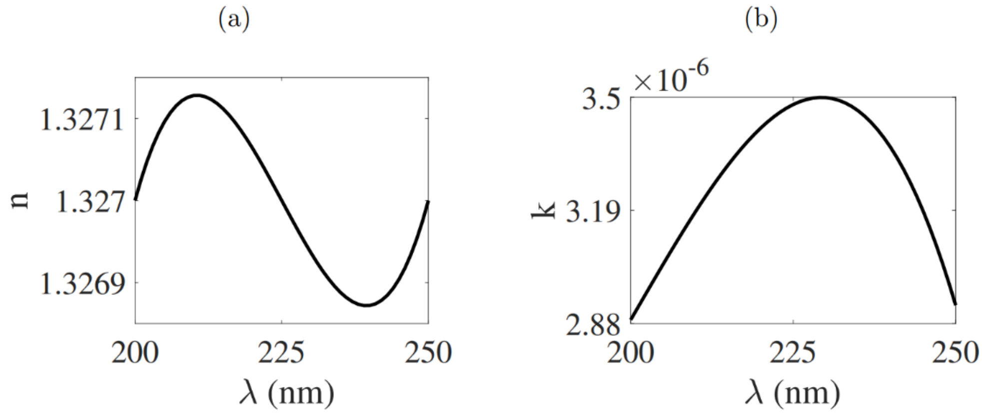

Figure S3. Spectral dependence of the refractive index of H_2O (**a**) real part n (**b**) imaginary part k.

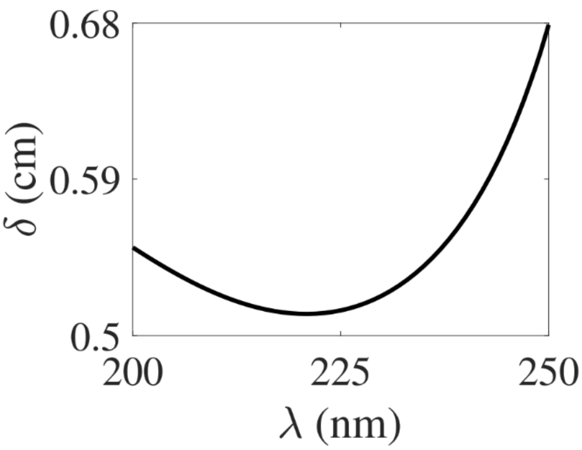

Figure S4. Spectral dependence of the penetration depth δ.