# Effect of Applicator Changes on Light Propagation and Heat Generation in Biological Tissue During Laser Irradiation in LITT

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Laser Interstitial Thermotherapy (LITT) is a surgical method for treatment of cancer in biological tissues such as liver, brain, prostate and neck. Mathematical modeling of the process in laser-tissue interactions during laser irradiation is essential for optimal treatment planning. In this study, we have analyzed the effect of applicator changes in light propagation and heat generation in biological tissue during LITT. For this purpose a three dimensional model was developed to study applicator changes effects. Monte Carlo Method with variable step size and implicit capture technique was used for simulation of light propagation in tissue. Finite Element Method (FEM) was used for solving Pennes and Arrhenius equations for distribution of temperature and damage in tissue, respectively. The results showed that decreasing the applicator size and its diameter cause higher temperature and damage volume and applicator position in tissue effects the temperature distribution and damage in tissue.