



## Numerical design of experiment for sensitivity analysis - application to skin burn injury prediction

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Résumé en anglais	Temperature evolution and skin burn process resulting from a laser radiation exposure are investigated in this paper. Transient temperature in skin is numerically estimated using a 1-D multilayered model based on Penne's equation. The degree of burn injury is numerically evaluated by using an Arrhenius-type function. Unfortunately, most of the mathematical model parameters are not well defined in literature. Thus, a sensitivity analysis has been performed in order to evaluate the effect of each parameters inaccuracy on temperature estimation and on burn injuries prediction (according to several authors' characterization). Investigated parameters uncertainties that crucially invalidate the thermal model are as follows: epidermis and dermis volumetric heat, extinction coefficient, and skin thickness of the affected area. Considering the damage prediction, the activation energy is a key parameter for the validation of an efficient predictive tool.
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