Title: Study of thermophysical properties of crystalline silicon and silicon-rich silicon oxide layers

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The decomposition of SiO_x film on SiO_2 and Si nanocrystals under the action of laser radiation has been investigated. Using the Comsol Multiphysics software package, the mathematical modeling of temperature distribution in the c-Si wafer and on the its surface have been carried out. It has been shown that laser pulses can efficiently warm the samples of crystalline silicon. During the laser pulse of 10 ns with intensity of 52 MW/cm^2 the temperature of 2100 K can be reached on the sample surface. The experimental investigation of IR spectra of the initial and laser annealed silicon wafer coated with SiO_x film confirmed the phase transformation of silicon oxide films. The changing of electrical conductivity of the films after laser irradiation points out on changing of the electron traps as a result of film structure transformation.