

Fig. 3. Finite element mesh (a) and properties of concrete (b)

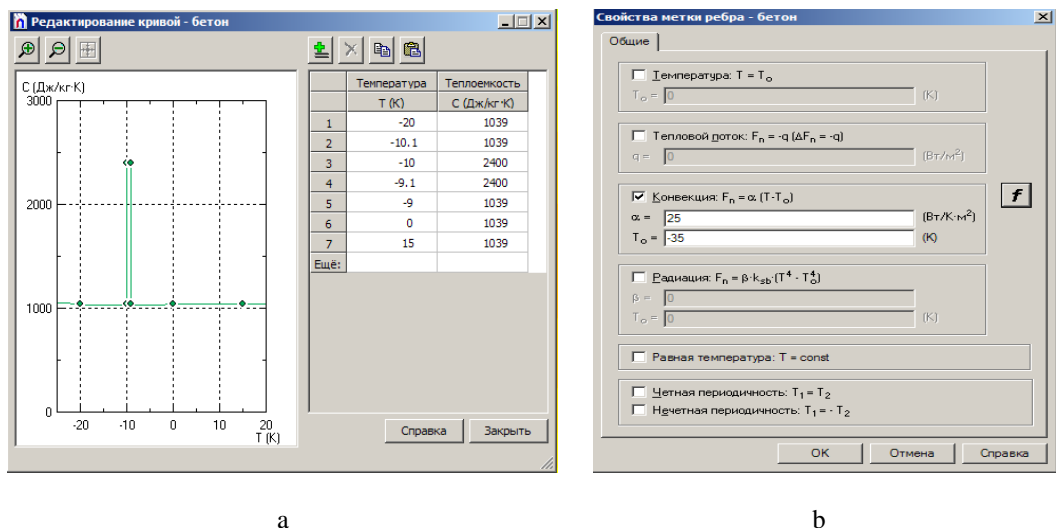


Fig. 4. Freezing of 10 g ice in a temperature range from -9 to -10°C (a) and the removal of heat from the rib section cube (b)

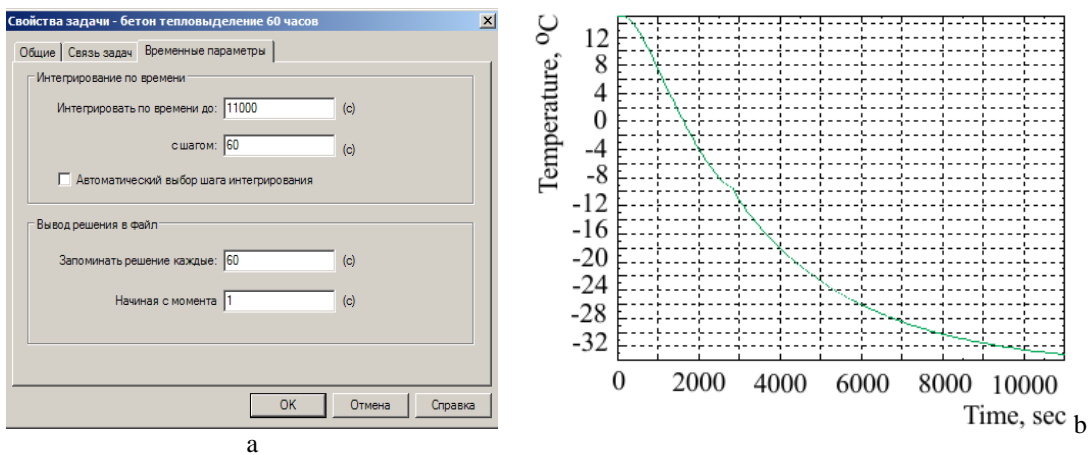
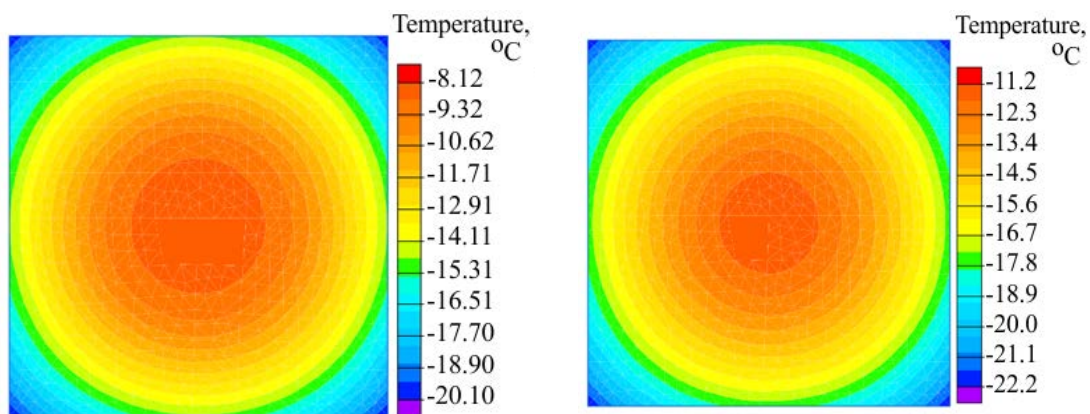


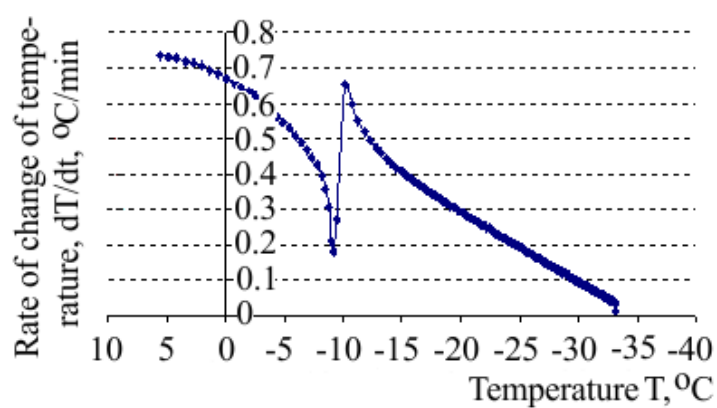
Fig. 5. Parameters of the model decisions (a) and the curve of temperature change in the center section cube (b)

2500 sec

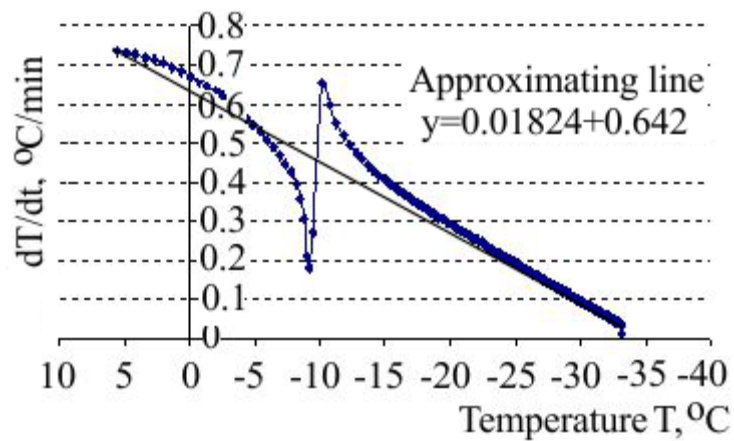
3000 sec



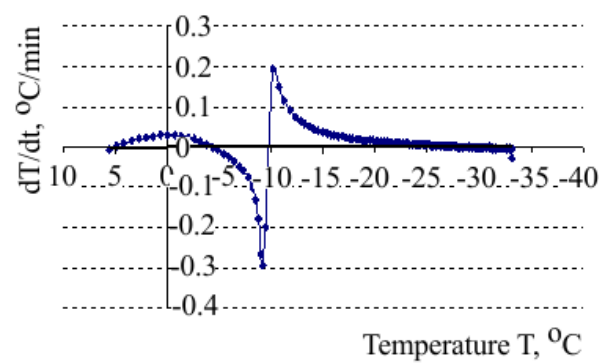
**Fig. 6.** The temperature distribution in the cross section of the cube on the 2500 and 3000 second account



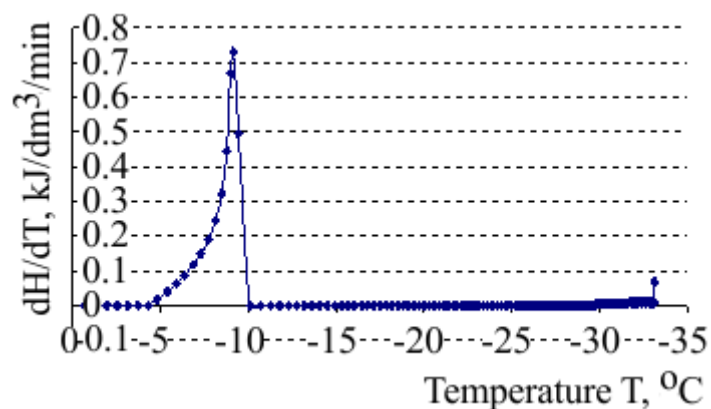
**Fig. 7.** The rate of change of temperature



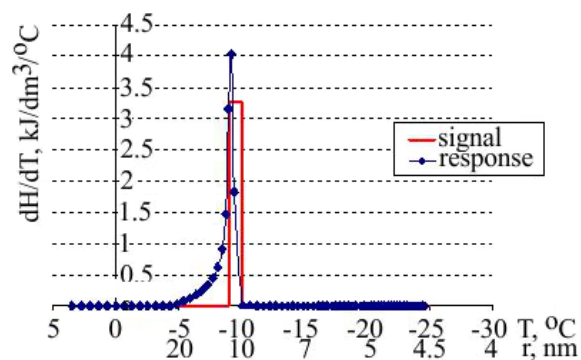
**Fig. 8.** Approximating line rate of temperature change



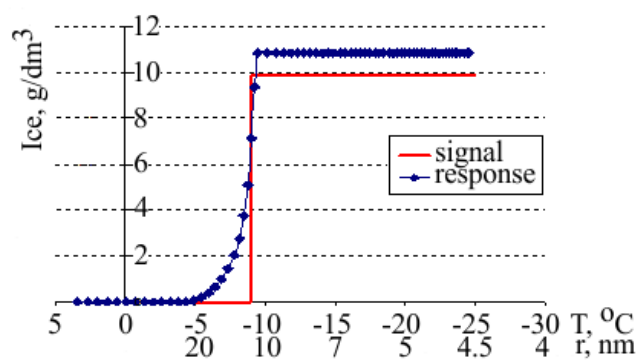
**Fig. 9.** The difference between the rate of change of the temperature curve and the approximating line



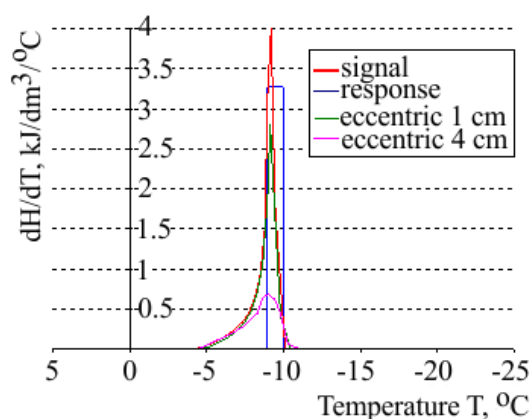
**Fig. 10.** The rate of change of the exothermic effect of the formation of ice



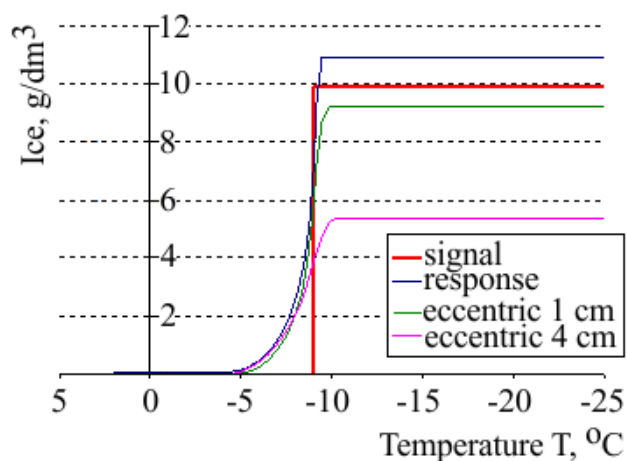
**Fig. 11.** Exothermic effects in the formation of ice: Signal - a predetermined pattern. Response - calculated by the proposed method



**Fig. 12.** The amount of ice formed: Signal - a predetermined pattern. Response - calculated by the proposed method



**Fig. 13.** Exothermic effects in the formation of ice: Signal - a predetermined pattern. Center - designed as measured at the center of the cube. Eccentric: 1 cm - calculated when measured at a distance of 1 cm from the center. Eccentric: 4 cm - calculated when measured at a distance of 4 cm from the center



**Fig. 14.** The amount of ice formed: Signal - a predetermined pattern. Center - calculated when measured at the center of the cube. Eccentric: 1 cm - calculated when measured at a distance of 1 cm from the center. Eccentric: 4 cm - calculated when measured at a distance of 4 cm from the center