

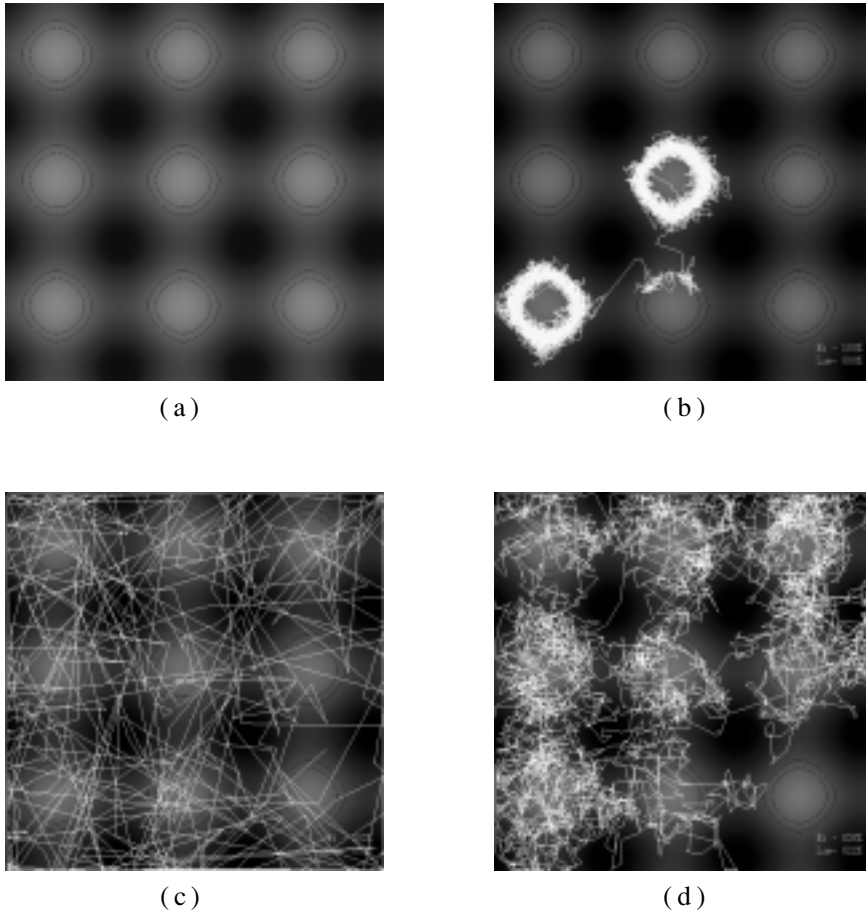


Fig. 11. Results of numerical simulations. (a) Temperature distribution, and (b) result in the case of $P_p = 1.0$ and $P_n = 0$, (c) in the case of $P_p = 0.03$ and $P_n = 0.03$, and (d) in the case of $P_p = 0.36$ and $P_n = 0.22$.

the moving direction with the probability P_p when it proceed toward the proper temperature and P_n toward improper temperature with random angle change. Values of P_n , P_p per unit time (1 sec) in observation are obtained as the inverse of average time interval of LDC and are estimated to range from 0.24 to 0.85 (these values correspond to the inverse of 4.20 s and 1.19 s in Table 2).

It is also assumed that the paramecium moves along the boundary when it meets to a boundary of the total area. The number of total time steps is assumed as 18000 (corresponding to 5 hours).

Furthermore, an evaluation function F for the behavior of the paramecium is assumed as