Supplementary Figure 2. Phase transition of orientation representation.
Orientation representation undergoes a sort of phase transition at $\beta = \beta_c$ from the random representation phase ($\beta < \beta_c$) to the orderly orientation map phase ($\beta > \beta_c$), when the value of the inverse temperature $\beta$ increases from 0. The top row shows the orientation representations at different values of $\beta$. The middle row indicates the radial power spectra of respective orientation representations. The bottom figure illustrates the $\beta$-dependence of the maximum power. The maximum power changes almost linearly within the interval of $30 \leq \beta \leq 45$, as indicated by the red line. The transition point $\beta_c$ is reasonably determined by the intersection of the red line with the horizontal axis, and we obtain $\beta_c \approx 28$ in the parameter setting of simulations that we performed in this study.