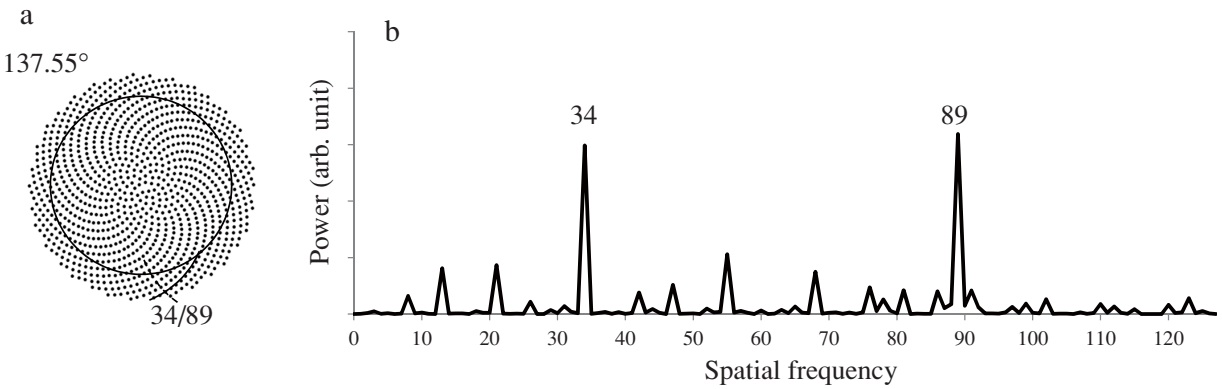

Fig. 11. (a) A simulated point pattern for a sunflower model with $\phi = 137.55^\circ$ and $n = 1000$. (b) The Fourier transform result for the area outside the black circle in panel (a).

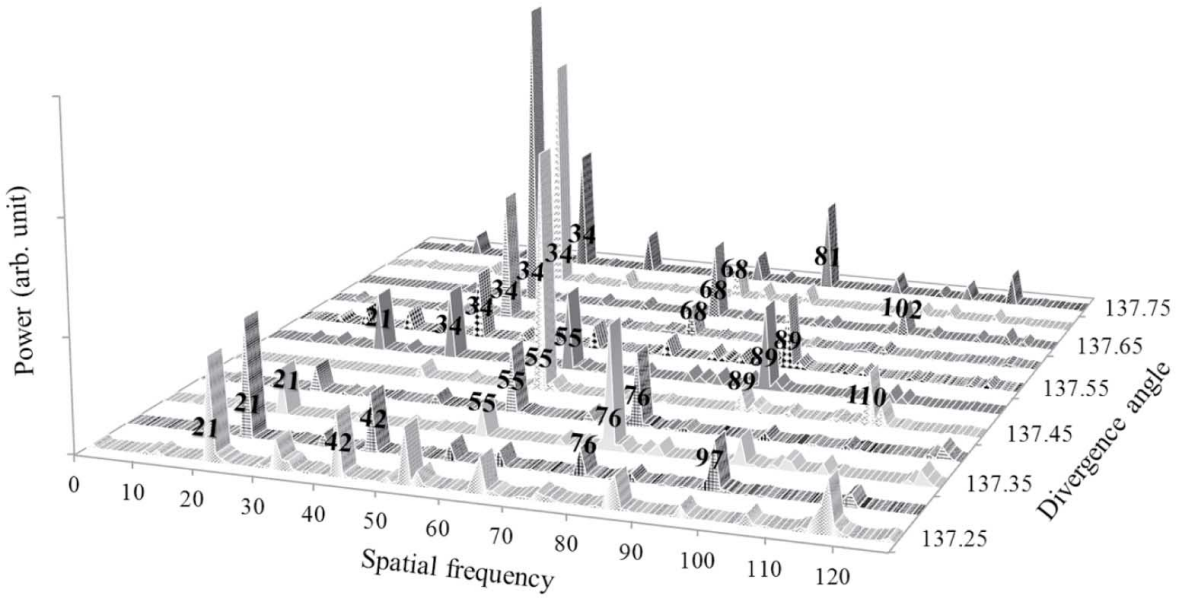

Fig. 12. Fourier transform results near the golden angle ϕ_τ in sunflower models with $n = 1000$ showing various parastichy numbers.

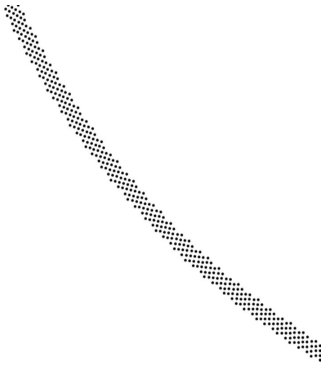

Fig. 13. One part of the simulated point pattern in the outer rim of a sunflower model with $p = 0.5$ and $\phi = \phi_\tau$.

tions. Figure 10(b) shows the Fourier transform result from the outer rim, showing two large peaks at 55 and 110. The number 55 was a Fibonacci number, and the number 110 must have been the second harmonic wave of 55. Harmonic waves seemed to appear as a characteristic feature of the Fourier transform. Conversely, Fig. 11(a) is the simulated point pattern for the case of $\phi = 137.55^\circ$, which was slightly greater than ϕ_τ. Figure 11(b) shows the Fourier transform result from the outer rim, and the large peaks were at 34 and 89. These numbers agreed with the parastichy numbers counted visually in the point pattern of Fig. 11(a) and were Fibonacci numbers.

Figure 12 shows the Fourier transform results of changing the angles from 137.25° to 137.75° in increments of 0.05° with $n = 1000$ and $p = 0.5$. Fourier peaks appeared at 21, 55, and 76 for a divergence angle of 137.35°. The numbers 21 and 55 were Fibonacci numbers; however, the number 76 was a Lucas number. The parastichy numbers were a mix of Fibonacci numbers and Lucas numbers. In addition, the spatial frequency of 97 was observed at a divergence angle of 137.30°. This number, 97, may belong to the generalized Fibonacci sequence $G(1, 4)$, judging from Table 1. Even for the slight angle change between 137.25° and 137.75°, spirals could be accurately counted and clas-