possesses motions that behave chaotically around the limit cycle of system (1.16)-(1.18) with $\mathcal{U}_t = 17.7$. Moreover, to support the presence of chaos in the response system, we depict in Figure 4 the time series of the $\mathcal{V}$ coordinate. The amplitude ranges $15 - 16.6$ and $7.4 - 8.6$ are used in Figure 4, (b) and (c), respectively, to increase the visibility of chaotic behavior.

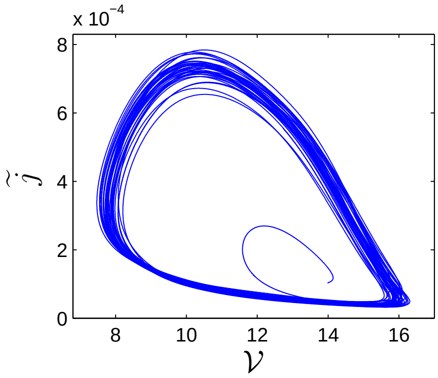

Figure 2: The trajectory of the response system (2.20) in the $\mathcal{V} - \widetilde{j}$ plane manifests the chaotic cycle.

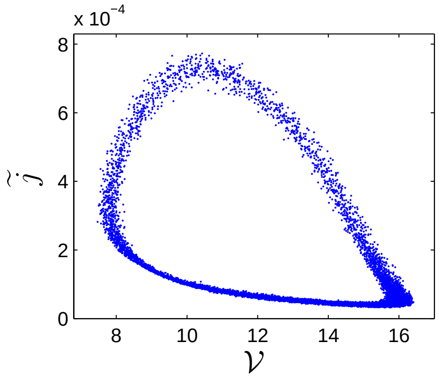

Figure 3: The projection of the stroboscopic plot of system (2.19)-(2.20) on the $\mathcal{V} - \widetilde{j}$ plane reveals the presence of chaotic behavior in the response system.

Figure 5, (a), (b) and (c) depict, respectively, the chaotic behavior in the electric field, electron density and ion density of system (2.20). These figures also support the presence of motions that behave chaotically around the limit cycle.

Now, let us compare our results with generalized synchronization (GS) [4]-[8]. According to Kocarev and Parlitz (1996), GS occurs for the coupled systems (1.1) and (1.2) if and only if for all $x_0 \in I_x$, y_{10}, $y_{20} \in I_y$, the asymptotic stability criterion $\lim_{t\to\infty} \|y(t, x_0, y_{10}) - y(t, x_0, y_{20})\| = 0$ holds, where $y(t, x_0, y_{10})$ and $y(t, x_0, y_{20})$ denote the solutions of (1.2) with the initial data $y(0, x_0, y_{10}) = y_{10}$, $y(0, x_0, y_{20}) = y_{20}$ and the same $x(t)$, $x(0) = x_0$. This criterion is a mathematical formulation of the auxiliary system approach [2, 8]. We shall make use of the auxiliary system approach to demonstrate the absence of generalized synchronization in the coupled system (2.19)-(2.20).