

### Description of Additional Supplementary Files

Supplementary Movie 1: Movie showing the evolution of fields  $\phi_1$  and the modulus  $|\phi|$  of the complex field  $\phi$  for  $\alpha_0 = 4$  and  $\alpha_1 = 5$ . (Video corresponding to Fig. 1a in the main text).

Supplementary Movie 2: Movie showing the evolution of fields  $\phi_1$  and the modulus  $|\phi|$  of the complex field  $\phi$  for  $\alpha_0 = 2.3$  and  $\alpha_1 = 4.6$ . (Video corresponding to Fig. 1b-c in the main text).

Supplementary Movie 3: Movie showing stable round droplets coexisting with a travelling wave for  $\alpha_0 = 7$  and  $\alpha_1 = 2$ . (Video corresponding to Fig. S7 in the Supplementary Information).

Supplementary Movie 4: Movie showing the evolution of fields  $\phi_1$  and  $\phi_2$  of the complex field  $\phi$  for  $\alpha_0 = \alpha_1 = 4$  and  $\phi = 0.25 + i0.25$ . The average composition can be used to change the dynamical steady state. (Video corresponding to Fig. 8a in the main text).

Supplementary Movie 5: Movie showing the evolution of fields  $\phi_1$  and  $\phi_2$  of the complex field  $\phi$  for  $\alpha_0 = \alpha_1 = 4$  and  $\phi = 0.4 + i0$ . The average composition can be used to change the dynamical steady state. (Video corresponding to Fig. 8b in the main text).