

Radboud University Nijmegen



Spiral Breakup in Excitable Tissue due to Lateral Instability

Marée, A.F.M., & Panlov, A.V. (1997). *Physical Review Letters*, 78, 1819-1822.



(a)



(b)



(c)



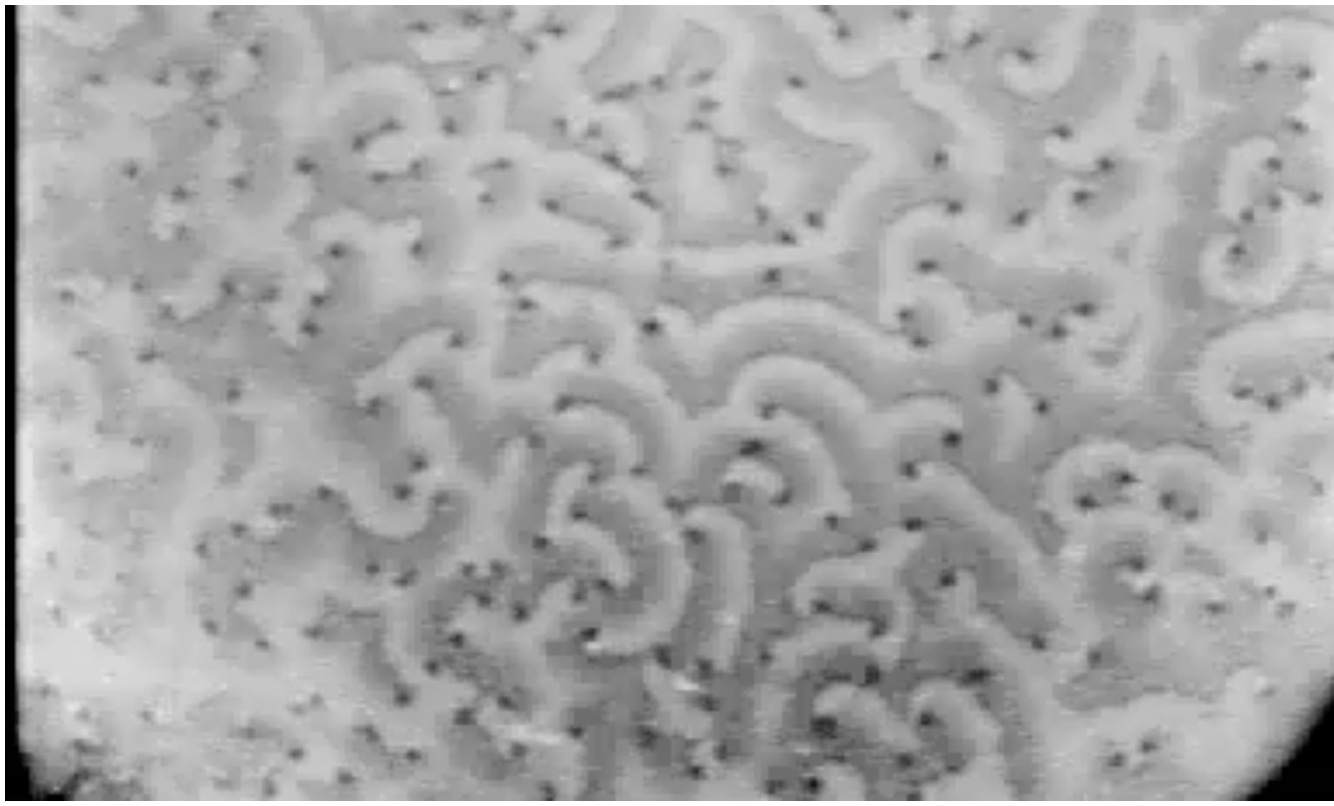
(d)

$$\frac{\partial e}{\partial t} = \Delta e - f(e) - g,$$

$$\frac{\partial g}{\partial t} = D_g \Delta g + \varepsilon(e, g)(ke - g),$$

Mathematical model of Diet

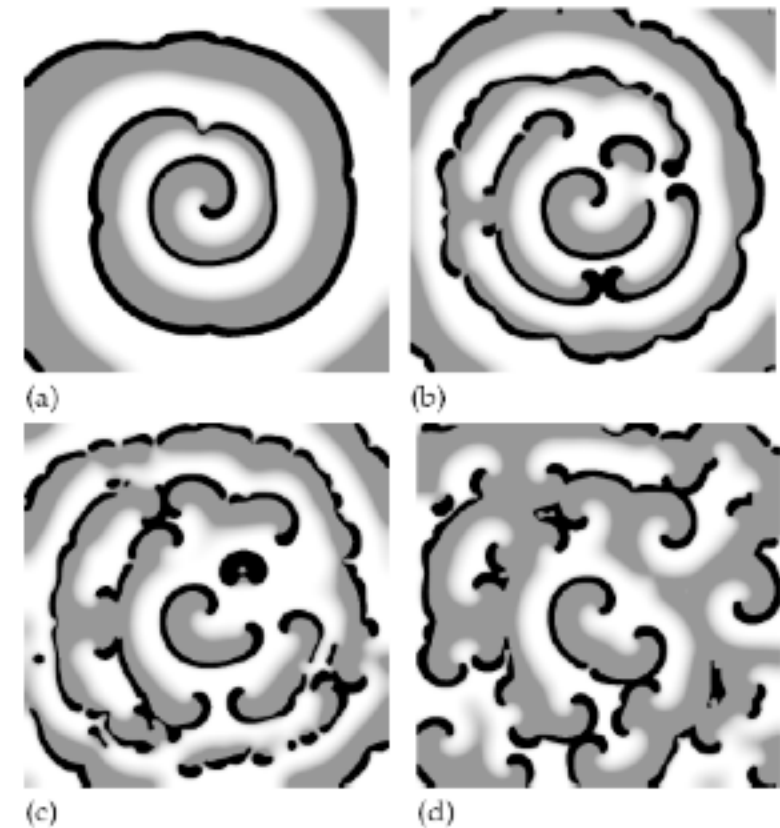
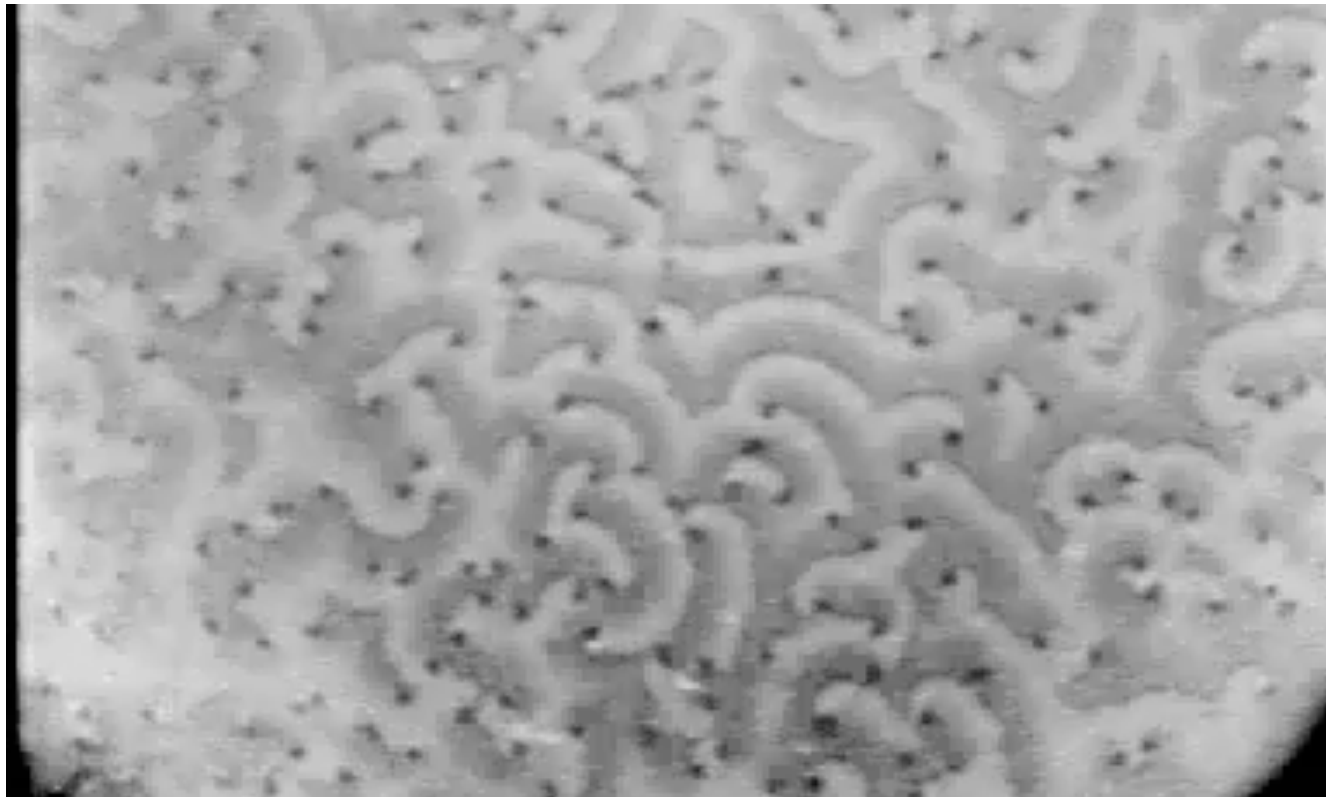




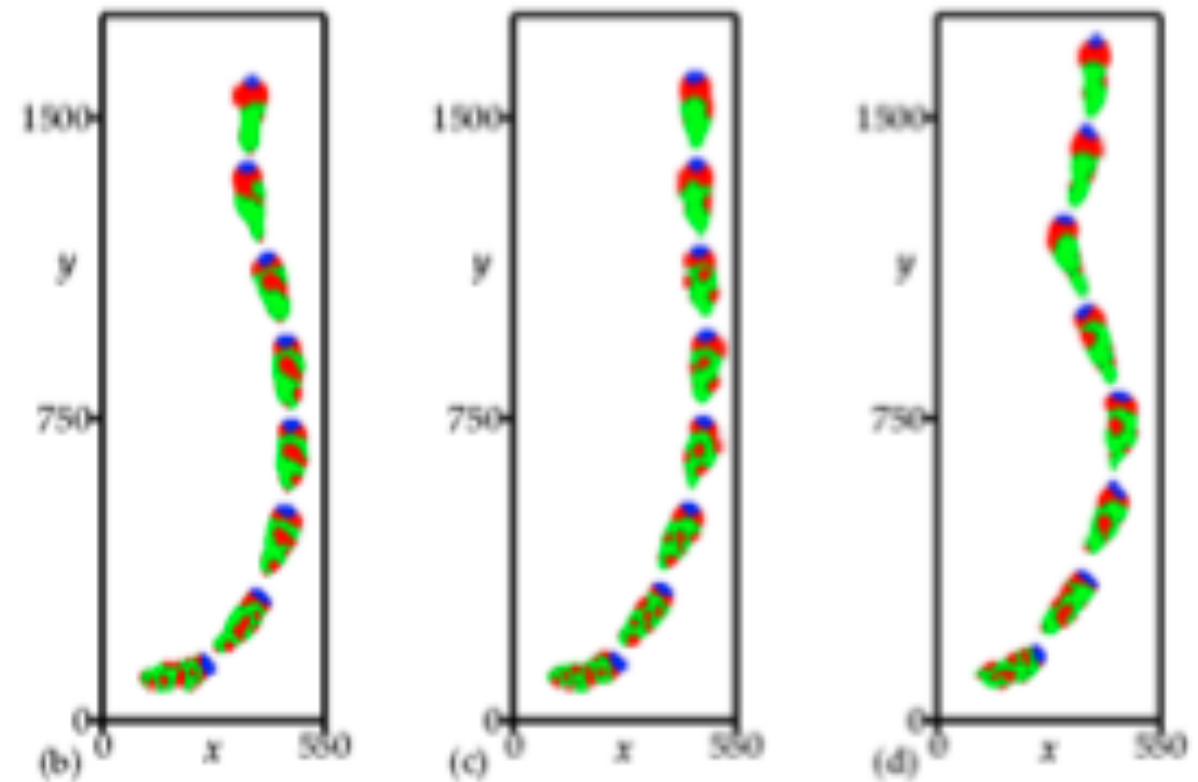
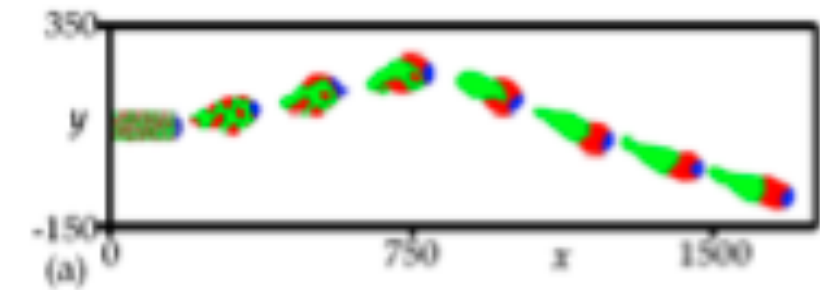
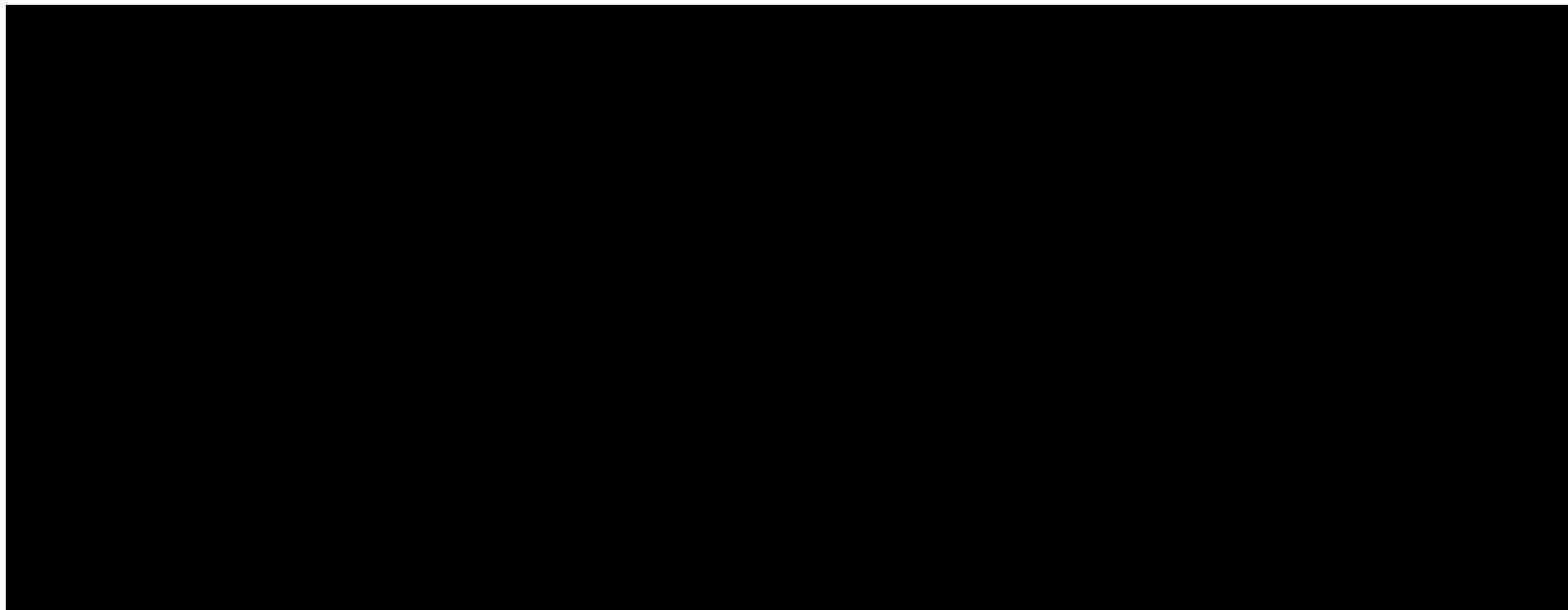


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$$\begin{aligned}\frac{\partial e}{\partial t} &= \Delta e - f(e) - g, \\ \frac{\partial g}{\partial t} &= D_g \Delta g + \varepsilon(e, g)(ke - g),\end{aligned}$$



$$H_{\sigma} = \sum \frac{J_{\text{cell,cell}}}{2} + \sum J_{\text{cell,medium}} + \lambda(v - V)^2,$$

$$\left. \begin{aligned} \frac{\partial c}{\partial t} &= D_c \Delta c - f(c) - r, \\ \frac{\partial r}{\partial t} &= \epsilon(c)(kc - r), \end{aligned} \right\} \text{inside the amoebae}$$

$$\left. \begin{aligned} \frac{\partial c}{\partial t} &= D_c \Delta c - d_c(c - c_0), \end{aligned} \right\} \text{outside the amoebae}$$

$$\Delta H' = \Delta H - \mu(c_{\text{automaton}} - c_{\text{neighbour}}),$$

Mathematical model of Dictyostelium