



Article submitted to journal

## Subject Areas:

xxxxx, xxxxx, xxxxx

## Keywords:

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## 1. Insert A head here

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### (a) Insert B head here

Subsection text here.

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## 2. Equations

Sample equations. [1][1,2] [1–3]

$$\begin{aligned}\frac{\partial u(t, x)}{\partial t} &= Au(t, x) \left( 1 - \frac{u(t, x)}{K} \right) - B \frac{u(t - \tau, x)w(t, x)}{1 + Eu(t - \tau, x)}, \\ \frac{\partial w(t, x)}{\partial t} &= \delta \frac{\partial^2 w(t, x)}{\partial x^2} - Cw(t, x) + D \frac{u(t - \tau, x)w(t, x)}{1 + Eu(t - \tau, x)},\end{aligned}\quad (2.1)$$

$$\begin{aligned}\frac{dU}{dt} &= \alpha U(t)(\gamma - U(t)) - \frac{U(t - \tau)W(t)}{1 + U(t - \tau)}, \\ \frac{dW}{dt} &= -W(t) + \beta \frac{U(t - \tau)W(t)}{1 + U(t - \tau)}.\end{aligned}\quad (2.2)$$

$$\begin{aligned}\frac{\partial(F_1, F_2)}{\partial(c, \omega)} \Big|_{(c_0, \omega_0)} &= \begin{vmatrix} \frac{\partial F_1}{\partial c} & \frac{\partial F_1}{\partial \omega} \\ \frac{\partial F_2}{\partial c} & \frac{\partial F_2}{\partial \omega} \end{vmatrix} \Big|_{(c_0, \omega_0)} \\ &= -4c_0q\omega_0 - 4c_0\omega_0p^2 = -4c_0\omega_0(q + p^2) > 0.\end{aligned}\quad (2.3)$$

### 3. Enunciations

**Theorem 3.1.** Assume that  $\alpha > 0, \gamma > 1, \beta > \frac{\gamma+1}{\gamma-1}$ . Then there exists a small  $\tau_1 > 0$ , such that for  $\tau \in [0, \tau_1)$ , if  $c$  crosses  $c(\tau)$  from the direction of to a small amplitude periodic traveling wave solution of (2.1), and the period of  $(\tilde{u}^p(s), \tilde{w}^p(s))$  is

$$\tilde{T}(c) = c \cdot \left[ \frac{2\pi}{\omega(\tau)} + O(c - c(\tau)) \right].$$

**Condition 3.1.** From (0.8) and (2.10), it holds  $\frac{d\omega}{d\tau} < 0, \frac{dc}{d\tau} < 0$  for  $\tau \in [0, \tau_1)$ . This fact yields that the system (2.1) with delay  $\tau > 0$  has the periodic traveling waves for smaller wave speed  $c$  than that the system (2.1) with  $\tau = 0$  does. That is, the delay perturbation stimulates an early occurrence of the traveling waves.

### 4. Figures & Tables

The output for figure is:

**Figure 1.** Insert figure caption here

The output for table is:

**Table 1.** An Example of a Table

date	Dutch policy	date	European policy
1988	Memorandum Prevention	1985	European Directive (85/339)
1991–1997	<b>Packaging Covenant I</b>		
1994	Law Environmental Management	1994	European Directive (94/62)
1997	Agreement Packaging and Packaging Waste		
1998–2002	<b>Packaging Covenant II</b>		
2003–2005	<b>Packaging Covenant III</b>		
2006–2007	<b>Decree on Packaging and paper</b>		

### 5. Conclusion

The conclusion text goes here.

Ethics. Insert ethics text here.

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Authors’ Contributions. Insert author contributions text here (to be included if more than one author).

Competing Interests. Insert competing interests text here.

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Acknowledgements. Insert acknowledgment text here.

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## References

1. Allwood JM, Cullen JM. 2011 *Sustainable materials: with both eyes open*. Cambridge, UK: UIT Cambridge. See <http://www.withbotheyesopen.com>.
2. MacKay DJC. 2008 *Sustainable energy: without the hot air*. Cambridge, UK: UIT Cambridge. See <http://www.withouthotair.com>.
3. Gallman PG. 2011 *Green alternatives and national energy strategy: the facts behind the headlines*. Baltimore, MD: Johns Hopkins University Press.
4. MacKay DJC. 2013. Solar energy in the context of energy use, energy transportation, and energy storage. *Proc. R. Soc. A* **371**.

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