Brief Article

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Let χ_B be the characteristic function on $\mathbb{R}$ given by $\chi_B(u) = 1$ if $u \in B$ and $\chi_B(u) = 0$ otherwise. Assume that k is a bounded and periodic function, and g is integrable with period $\phi(> 0)$ and is differentiable at least $q - 1$ times. In this paper we consider the following assumptions:

1. k has sufficient decay;
2. $b - a > \phi(g)$ and $b - a < \frac{\phi(g)\phi(\chi_{[a,b]})}{\phi(g) - \phi(\chi_{[a,b]})}$;
3. $\int_{-\infty}^{\infty} k(x-y)\chi_{[a,b]}(y)\,\mathrm{d}y < \int_{-\infty}^{\infty} k(x-y)\chi_{[b,\infty)}(y)\,\mathrm{d}y$.

The main results of this paper are the following theorems:

1. The condition (i) and (iii) imply that k is symmetric with respect to a and b.
2. If $a - b > 0$, then g is nondecreasing.
3. $u_c = \frac{2ab}{a+b}$ is the spreading speed for $g = k + a - b$ and $a + b > 0$. u_c is the asymptotic velocity of a spreading mode, and is well defined if the integral of g is finite and positive.
4. There is a unique spreading mode if $a - b > 0$ and $\int_{-\infty}^{\infty} g(x)\,\mathrm{d}x$ is finite.
5. If $a - b < 0$, then g is nonmonotone and g has at most one minimum