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Profile of Blow-up Solution to Hyperbolic System with Nonlocal Term

段志文(1)，Kwang Ik KIM(2)

(1)华中科技大学（武汉430074），数学系; (2)Department of Mathematics, Pohang University of Science and Technology, Pohang, 790-784, Republic of Korea

摘要
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Zhi Wen DUAN(1), Kwang Ik KIM(2)

(1)Department of Mathematics, Huazhong University of Science and Technology,Wuhan 430074, P. R. China; (2)Department of Mathematics, Pohang University of Science and Technology, Pohang, 790-784, Republic of Korea

Abstract This paper is concerned with a nonlocal hyperbolic system as follows:
$$\begin{aligned} & u_{tt}=\triangle u+\bigg(\int_\Omega vdx\bigg)^{p} \quad \textrm{for}\,\,x\in \mathbb{R}^N, \,\, t>0, \\ & v_{tt}=\triangle v+\bigg(\int_\Omega udx\bigg)^{q} \quad \textrm{for}\,\,x\in \mathbb{R}^N, \,\, t>0, \\ & u(x,0)= u_0 (x), \,\, u_t(x,0)=u_{01}(x) \quad \textrm{for}\,\, x\in \mathbb{R}^N, \\ & v(x,0)= v_0 (x), \,\, v_t(x,0)=v_{01}(x) \quad \textrm{for}\,\, x\in \mathbb{R}^N,\end{aligned}$$
where $1 \leq N \leq 3$, $p \geq 1$, $q \geq 1$ and $pq > 1$. Here the initial values are compactly supported and $\Omega \subset \mathbb{R}^N$ is a bounded open region. The blow-up curve, blow-up rate and profile of the solution are discussed.

Key words   hyperbolic system   nonlocal term   blow-up profile

通讯作者 段志文 duanzhw@hust.edu.cn

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