HYPERBOLIC EQUATIONS OF VON KARMAN TYPE IN HIGH SPACE DIMENSIONS

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We investigate weak solutions of a hyperbolic system of equations of Von Karman type on the whole space $\mathbf{R}^{2m}$, $m \geq 2$. The system is a generalization of the so-called von-Karman equations of thin plates in space dimension 2 (i.e., $m = 1$), in which case the non-linear operator, which is of Monge-Ampère type, reduces to the Hessian determinant of the second derivatives of the unknown function. This problem in mathematical biology is related to population waves. We establish the existence of a global weak solution, and the local well-posedness of strong solutions to the initial value problem, in a suitable framework of Sobolev spaces. We point out some open problems concerning the long time behavior of such solutions, when they do exist for all time.