

Accepted Manuscript

Global well-posedness for 2D nonlinear wave equations without compact support

Yuan Cai, Zhen Lei, Nader Masmoudi

PII: S0021-7824(17)30136-8

DOI: <https://doi.org/10.1016/j.matpur.2017.09.011>

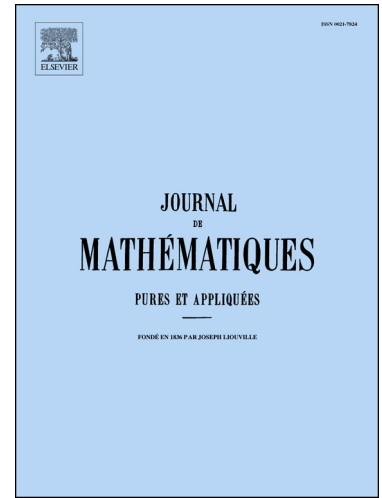
Reference: MATPUR 2937

To appear in: *Journal de Mathématiques Pures et Appliquées*

Received date: 22 November 2016

Please cite this article in press as: Y. Cai et al., Global well-posedness for 2D nonlinear wave equations without compact support, *J. Math. Pures Appl.* (2017), <https://doi.org/10.1016/j.matpur.2017.09.011>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Global Well-posedness for 2D Nonlinear Wave Equations without Compact Support

Yuan Cai^{a,*}, Zhen Lei^{a,b}, Nader Masmoudi^c

^a*School of Mathematical Sciences, Fudan University, Shanghai 200433, P. R. China.*

^b*Shanghai Center for Mathematical Sciences, Shanghai 200433, P. R. China.*

^c*Courant Institute of Mathematical Sciences, New York University, NY 10012, USA.*

Abstract

In the significant work of [6], Alinhac proved the global existence of small solutions for 2D quasilinear wave equations under the null conditions. The proof heavily relies on the fact that the initial data have compact support [23]. Whether this constraint can be removed or not is still unclear. In this paper, for fully nonlinear wave equations under the null conditions, we prove the global well-posedness for small initial data without compact support. Moreover, we apply our result to a class of quasilinear wave equations.

Dans un travail important, Alinhac [6] a prouvé l'existence globale de solutions petites pour les équations des ondes en 2D sous la condition nulle. La preuve repose en grande partie sur le fait que les données initiales ont un support compact [23]. Que cette contrainte peut être retirée ou non est encore une question ouverte. Dans ce papier, pour les équations des ondes totalement non linéaires avec la condition nulle, nous démontrons l'existence globale pour des données initiales petites sans l'hypothèse de support compact. De plus, nous appliquons notre résultat à une classe d'équations d'ondes quasilineaires.

Keywords: Global well-posedness, Two dimensional nonlinear wave equations, Without compact support, Null condition

2010 MSC: , 35L05, 35L70, 35L72

1. Introduction

Global well-posedness for nonlinear wave equations is a well-oiled mathematical topic. Many mathematicians including S. Alinhac, D. Christodoulou, L. Hörmander, F. John, S. Klainerman, etc. have made tremendous contributions to this subject. The first nontrivial long-time existence result

*Corresponding author

Email addresses: ycai14@fudan.edu.cn (Yuan Cai), zlei@fudan.edu.cn (Zhen Lei), masmoudi@cims.nyu.edu (Nader Masmoudi)

Download English Version:

<https://daneshyari.com/en/article/8902395>

Download Persian Version:

<https://daneshyari.com/article/8902395>

[Daneshyari.com](https://daneshyari.com)