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| 1. Record Nr.           | UNINA9910960017603321                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Autore                  | Burzio Stefano                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Titolo                  | Type II Blow up Solutions with Optimal Stability Properties for the Critical Focussing Nonlinear Wave Equation on                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Pubbl/distr/stampa      | Providence : , : American Mathematical Society, , 2022<br>©2022                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| ISBN                    | 9781470471699<br>1470471698                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Edizione                | [1st ed.]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Descrizione fisica      | 1 online resource (88 pages)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Collana                 | Memoirs of the American Mathematical Society ; ; v.278                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Classificazione         | 35L0535B40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Altri autori (Persone)  | KriegerJoachim                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Disciplina              | 515/.353<br>515.353                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Soggetti                | Nonlinear wave equations<br>Blowing up (Algebraic geometry)<br>Perturbation (Mathematics)<br>Asymptotic expansions<br>Iterative methods (Mathematics)<br>Fourier transformations<br>Partial differential equations -- Hyperbolic equations and systems --<br>Wave equation<br>Partial differential equations -- Qualitative properties of solutions --<br>Asymptotic behavior of solutions                                                                                                                                                                                                                                                                                                                                                                                         |
| Lingua di pubblicazione | Inglese                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Formato                 | Materiale a stampa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Livello bibliografico   | Monografia                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Nota di contenuto       | Cover -- Title page -- Chapter 1. Introduction -- 1.1. The type II blow up solutions of [33], [32] -- 1.2. The effect of symmetries on the solutions of Theorem 1.1 -- 1.3. Conditional stability of type II solutions -- 1.4. Spectral theory associated with the linearisation -- 1.5. Description of the data perturbation in terms of the distorted Fourier transform -- 1.6. Outline of the main result from [26] -- 1.7. Figures -- Chapter 2. The main theorem and outline of the proof -- 2.1. The main theorem -- 2.2. Outline of the proof -- Chapter 3. Construction of a two parameter family of approximate blow up solutions -- 3.1. Step 0: the bulk term -- 3.2. Step 1: choice of the first correction -- 3.3. Step 2: the error -- 3.4. Step 3: choice of second |

correction -- 3.5. Step 4: the error -- 3.6. Step 5: inductive step -- 3.7. Step 6: choice of  $\{ \epsilon_1, \epsilon_2 \}$ ,  $\epsilon_1, \epsilon_2 = 1, 2$  -- Chapter 4. Modulation theory -- determination of the parameters  $\{ \epsilon_1, \epsilon_2 \}$ . -- 4.1. Re-scalings and the distorted Fourier transform -- 4.2. The effect of scaling the bulk part -- Chapter 5. Iterative construction of blow up solution almost matching the perturbed initial data -- 5.1. Formulation of the perturbation problem on Fourier side -- 5.2. The proof of Theorem 5.1 -- 5.3. Translation to original coordinate system -- Chapter 6. Proof of Theorem 2.1 -- Chapter 7. Outlook -- Bibliography -- Index -- Back Cover.

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## Sommario/riassunto

"We show that the finite time type II blow up solutions for the energy critical nonlinear wave equation on constructed in Krieger, Schlag, and Tartaru ("Slow blow-up solutions for the critical focusing semilinear wave equation", 2009) and Krieger and Schlag ("Full range of blow up exponents for the quintic wave equation in three dimensions", 2014) are stable along a co-dimension one Lipschitz manifold of data perturbations in a suitable topology, provided the scaling parameter is sufficiently close to the self-similar rate, i. e., is sufficiently small. This result is qualitatively optimal in light of the result of Krieger, Nakamishi, and Schlag ("Center-stable manifold of the ground state in the energy space for the critical wave equation", 2015). The paper builds on the analysis of Krieger and Wong ("On type I blow-up formation for the critical NLW", 2014)"--

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