

Jérémie Szeftel

Publications

Papers in refereed journals

1. Absorbing boundary conditions for reaction diffusion equation, *IMA J. Appl. Math.*, **68** (2), 167-184, 2003.
2. Réflexion des singularités pour l'équation de Schrödinger, *Comm. Partial Differential Equations*, **29** (5-6), 707-761, 2004.
3. Long time existence for small data nonlinear Klein-Gordon equations on tori and spheres (with J.M. Delort), *Int. Math. Res. Not.* **37**, 1897-1966, 2004.
4. Design of absorbing boundary conditions for Schrödinger equations in R^d , *SIAM J. Numer. Anal.*, **42** (4), 1527-1551, 2004.
5. Propagation et réflexion des singularités pour l'équation de Schrödinger non linéaire, *Ann. Inst. Fourier (Grenoble)*, **55** (2), 573-671, 2005.
6. Microlocal smoothing effect for the nonlinear Schrödinger equation, *SIAM J. Math. Anal.*, **37** (2), 549-597, 2005.
7. A nonlinear approach to absorbing boundary conditions for the semilinear wave equation, *Math. Comp.*, **75**, 565-594, 2006.
8. Absorbing boundary conditions for nonlinear scalar partial differential equations, *Comput. Methods Appl. Mech. Engrg.*, **195**, 3760-3775, 2006.
9. Absorbing boundary conditions for nonlinear Schrödinger equations, *Numerische Mathematik*, **104**, 103-127, 2006.
10. Almost orthogonality properties of products of eigenfunctions and applications to long-time existence for semi-linear Klein-Gordon equations on Zoll Manifolds (with J.M. Delort), *Amer. J. Math.*, **128**, 1187-1218, 2006.

11. Bounded almost global solutions for non hamiltonian semi-linear Klein-Gordon equations with radial data on compact revolution hypersurfaces (with J. M. Delort), *Ann. Inst. Fourier (Grenoble)*, **56**, 1419-1456, 2006.
12. Almost global existence for Hamiltonian semi-linear Klein-Gordon equations with small Cauchy data on Zoll manifolds (with D. Bambusi, J. M. Delort and B. Grébert), *Comm. Pure. Appl. Math.*, **60**, 1665-1690, 2007.
13. Nonlinear Nonoverlapping Schwarz Waveform Relaxation for Semilinear Wave Propagation (with L. Halpern), *Math. Comp.*, **78**, 865-889, 2009.
14. Standing ring blow up solutions to the N-dimensional quintic nonlinear Schrödinger equation (with P. Raphaël), *Comm. Math. Phys.*, **290** (3), 973-996, 2009.
15. Towards accurate artificial boundary conditions for nonlinear PDEs through examples (with X. Antoine and C. Besse), *Cubo*, **11** (4), 29-48, 2009.
16. Schwarz waveform relaxation algorithms for semilinear reaction-diffusion equations (with F. Caetano, M. Gander and L. Halpern). *Netw. Heterog. Media*, **5** (3), 487-505, 2010.
17. Stable self similar blow up dynamics for slightly L^2 supercritical NLS equations (with F. Merle and P. Raphaël). *Geom. Funct. Anal.*, **20** (4), 1028-1071, 2010.
18. Optimized and Quasi-Optimal Schwarz Waveform Relaxation for the One Dimensional Schrödinger equation (with L. Halpern). *Math. Models Methods Appl. Sci.*, **20** (12), 2167-2199, 2010.
19. Existence and uniqueness of minimal blow up solutions to an inhomogeneous mass critical NLS (with P. Raphaël). *J. Amer. Math. Soc.*, **24**, 471-546, 2011.
20. Optimized Schwarz waveform relaxation and discontinuous Galerkin time stepping for heterogeneous problems (with C. Japhet and L. Halpern). *SIAM J. Numer. Anal.*, **50** (5), 2588-2611, 2012.
21. The instability of the Bourgain-Wang solutions for the L^2 critical NLS (with F. Merle and P. Raphaël). *Amer. J. Math.* **135** (4), 967-1017, 2013.

22. On collapsing ring blow up solutions to the mass supercritical NLS (with F. Merle and P. Raphaël). *Duke Math. J.* **163** (2), 369-431, 2014.
23. The bounded L^2 curvature conjecture (with S. Klainerman and I. Rodnianski). *Invent. Math.* **202** (1), 91-216, 2015.
24. Variants of the focusing NLS equation. Derivation, justification and open problems related to filamentation (with E. Dumas and D. Lannes). *Laser Filamentation, CRM Series in Mathematical Physics*, pages 19-75, Springer International Publishing, 2016.
25. Codimension one stability of the catenoid under the vanishing mean curvature flow in Minkowski space (with R. Donninger, J. Krieger and W. Wong). *Duke Math. J.* **165** (4), 723-791, 2016.
26. Sharp Strichartz estimates for the wave equation on a rough background. *Annales Scientifiques de l'Ecole Normale Supérieure*, **49** (6), 1279-1309, 2016.
27. Global regularity for the 2+1 dimensional equivariant Einstein-wave map system (with L. Andersson and N. Gudapati). *Ann. PDE* **3** (2), Art. 13, 142 pp., 2017.
28. Parametrix for wave equations on a rough background III: space-time regularity of the phase. *Astérisque* **401**, 321 pp., 2018.
29. On the stability of type I blow up for the energy super critical heat equation (with C. Collot and P. Raphaël). *Mem. Amer. Math. Soc.* **260**, no 1255, v+97 pp., 2019.
30. On strongly anisotropic type I blow up (with F. Merle and P. Raphaël). *Int. Math. Res. Not.*, 541-606, 2020.
31. Global nonlinear stability of Schwarzschild spacetime under polarized perturbations (with S. Klainerman). Accepted in *Annals of Math Studies*, 907 pp.

Preprints

1. Parametrix for wave equations on a rough background I: regularity of the phase at initial time. Submitted, 145 pp., arXiv:1204.1768.
2. Parametrix for wave equations on a rough background II: control at initial time. Submitted, 84 pp., arXiv:1204.1769.
3. Parametrix for wave equations on a rough background IV: Control of the error term. Submitted, 284 pp., arXiv:1204.1771.
4. Constructions of GCM spheres in perturbations of Kerr (with S. Klainerman). Submitted, 138 pp., arXiv:1911.00697.
5. Effective results on uniformization and intrinsic GCM spheres in perturbations of Kerr (with S. Klainerman). Submitted, 76 pp., arXiv:1912.12195.
6. On smooth self similar solutions to the compressible Euler equations (with F. Merle, P. Raphaël and I. Rodnianski). Submitted, 168 pp., arXiv:1912.10998.
7. On blow up for the energy super critical defocusing non linear Schrödinger equations (with F. Merle, P. Raphaël and I. Rodnianski). Submitted, 107 pp., arXiv:1912.11005.
8. On the implosion of a three dimensional compressible fluid (with F. Merle, P. Raphaël and I. Rodnianski). Submitted, 83 pp., arXiv:1912.11009.
9. A general formalism for the stability of Kerr (with E. Giorgi and S. Klainerman). 139 pp., arXiv:2002.02740.

Proceedings

1. Réflexion des singularités pour l'équation de Schrödinger, Séminaire: Equations aux Dérivées Partielles. 2003–2004, Exp. No. XXI, 11 pp., *Sémin. Equ. Dériv. Partielles*, Ecole Polytech., Palaiseau, 2004.
2. Almost global solutions for non Hamiltonian semi-linear Klein-Gordon equations on compact revolution hypersurfaces (with J. M. Delort), Journées “Equations aux Dérivées Partielles”, Exp. No. XV, 13 pp., Forges-les-Eaux, 2005.

3. Long time existence for small data semilinear Klein-Gordon equations on spheres (with J. M. Delort), *Mathematical aspects of nonlinear dispersive equations*, 171–179, *Ann. of Math. Stud.*, 163, Princeton Univ. Press, Princeton, NJ, 2007.
4. Optimized and Quasi-Optimal Schwarz Waveform Relaxation for the One Dimensional Schrödinger equation (with L. Halpern), *Domain Decomposition Methods in Science and Engineering XVII*, 221–228, *Lect. Notes Comput. Sci. Eng.*, Vol. 60, Springer, Berlin, 2008.
5. Around the bounded L^2 curvature conjecture in general relativity (with S. Klainerman and I. Rodnianski), *Journées “Equations aux Dérivées Partielles”*, Exp. No. IX, 15 pp., *Evian*, 2008.
6. Two blow-up regimes for the L^2 super critical nonlinear Schrödinger (with F. Merle and P. Raphaël), *Séminaire: Equations aux Dérivées Partielles. 2009–2010*, Exp. No. II, 11 pp., *Sémin. Equ. Dériv. Partielles*, Ecole Polytech., Palaiseau, 2010.
7. Existence and uniqueness of minimal blow up solutions to an inhomogeneous mass critical NLS (with P. Raphaël). Oberwolfach report, 2010.
8. Space-time non conforming optimized Schwarz waveform relaxation for heterogeneous problems and general geometries (with C. Japhet and L. Halpern). *Domain Decomposition Methods in Science and Engineering XIX*, 75–86, *Lect. Notes Comput. Sci. Eng.*, Vol. 78, Springer, Heidelberg, 2011.
9. Discontinuous Galerkin and non conforming in time optimized Schwarz waveform relaxation (with C. Japhet and L. Halpern). *Domain Decomposition Methods in Science and Engineering XIX*, 133–140, *Lect. Notes Comput. Sci. Eng.*, Vol. 78, Springer, Heidelberg, 2011.
10. Schwarz Waveform Relaxation Algorithms with Nonlinear Transmission Conditions for Reaction-Diffusion Equations (with F. Caetano, M. Gander and L. Halpern). *Domain Decomposition Methods in Science and Engineering XIX*, 245–252, *Lect. Notes Comput. Sci. Eng.*, Vol. 78, Springer, Heidelberg, 2011.
11. The resolution of the bounded L^2 curvature conjecture in general relativity (with S. Klainerman and I. Rodnianski), *Proceedings of the International Congress of Mathematicians, Seoul 2014*. Vol. III, 895–913, Kyung Moon Sa, Seoul, 2014.

12. The resolution of the bounded L^2 curvature conjecture in general relativity (with S. Klainerman and I. Rodnianski), Séminaire: Laurent Schwarz, 2014–2015, Exp. No. XXI, 18 pp., Ecole Polytech., Palaiseau, 2015.
13. The resolution of the bounded L^2 curvature conjecture in general relativity (with S. Klainerman and I. Rodnianski), Bull. Braz. Math. Soc., New Series **47** (2), 445–456, 2016.

Review paper

1. Near soliton dynamics and the formation of singularities in L^2 -critical problems (with Y. Martel, F. Merle and P. Raphaël). Russian Math. Surveys **69**, 261-290, 2014.