

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). *Annals of Math Studies*, 210. Princeton University Press, Princeton, NJ, 2020, xviii+856 pp.
32. On blow up for the energy super critical defocusing non linear Schrödinger equations (with F. Merle, P. Raphaël and I. Rodnianski). *Invent. Math.* **227** (1), 247-413, 2022.

33. On the implosion of a compressible fluid I: Smooth self-similar inviscid profiles (with F. Merle, P. Raphaël and I. Rodnianski). *Annals of Math.* **196** (2022), no. 2, 567–778.
34. On the implosion of a compressible fluid II: Singularity formation (with F. Merle, P. Raphaël and I. Rodnianski). *Annals of Math.* **196** (2022), no. 2, 779–889.
35. Construction of GCM spheres in perturbations of Kerr (with S. Klainerman). *Ann. PDE*, **8** (2), Art. 17, 153 pp., 2022.
36. Effective results on uniformization and intrinsic GCM spheres in perturbations of Kerr (with S. Klainerman). *Ann. PDE*, **8** (2), Art. 18, 89 pp., 2022.

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. Kerr stability for small angular momentum (with S. Klainerman). Submitted, 799 pp., arXiv:2104.11857.
5. Wave equations estimates and the nonlinear stability of slowly rotating Kerr black holes (with E. Giorgi and S. Klainerman). Submitted, 912 pp., arXiv:2205.14808.

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.