List of Publications

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International Journal Papers

[J1] V. Manfredi, A. Masi, A.G. Özcebe, R. Paolucci, and **C. Smerzini** (2021) Selection and spectral matching of recorded ground motions for seismic fragility analyses. *Bulletin of Earthquake Engineering, submitted*.

[J2] F. Di Michele, J. May, D. Pera, V. Kastelic, M. Carafa, **C. Smerzini**, I. Mazzieri, B. Rubino, P. F. Antonietti, A. Quarteroni, R. Aloisio, and P. Marcati (2021) Spectral elements numerical simulation of the 2009 L'Aquila earthquake on a detailed reconstructed domain. *Geophysical Journal International, under review*.

[J3] R. Paolucci, **C.Smerzini**, and M. Vanini(2021) BB-SPEEDset: a validated dataset of broadband near-source earthquake ground motions from 3D physics-based numerical simulations. *Bulletin of Seismological Society of America*, https://doi.org/10.1785/0120210089.

[J4] E. Schiappapietra, and **C.Smerzini** (2021) Spatial correlation of earthquake ground motion in Norcia (Central Italy) from broadband physics-based simulations. *Bulletin of Earthquake Engineering*, https://doi.org/10.1007/s10518-021-01160-7

[J5] M. Infantino, **C.Smerzini**, and J. Lin (2021) Spatial correlation of spectral accelerations from broadband physics-based numerical simulations. *Earthquake Engineering and Structural Dynamics*, 50(10): 2575-2594.

[J6] R. Rodríguez-Plata, A. G. Özcebe, **C.Smerzini**, and C. G. Lai (2021) Aggravation factors for 2D site effects in sedimentary basins: the case of Norcia, Central Italy. *Soil Dynamics and Earthquake Engineering*, 149: 106854, https://doi.org/10.1016/j.soildyn.2021.106854.

[J7] R. Paolucci, I. Mazzieri, G. Piunno, **C.Smerzini**, M. Vanini, and A.G. Özcebe (2021) Earthquake ground motion modelling of induced seismicity in the Groningen gas field, *Earthquake Engineering and Structural Dynamics*, 50(1): 135-154.

[J8] P. F. Antonietti, I. Mazzieri, L. Melas, R. Paolucci, A. Quarteroni, **C.Smerzini**, and M. Stupazzini (2020) Three-dimensional physics-based earthquake ground motion simulations for seismic risk assessment in densely populated urban areas. *Mathematics in Engineering*, 3(2): 1-31.

[J9] A. G. Özcebe, **C.Smerzini**, and V. Bhanu (2020) Insights into the effect of spatial variability of recorded earthquake ground motion on the response of a bridge structure. *Journal of Earthquake Engineering*, 24(6): 920-946.

[J10] R. Guidotti, M. Stupazzini, **C.Smerzini**, and R. Paolucci (2019) Comment on "Broadband ground-motion simulation of the 2011 Mw 6.2 Christchurch, new Zealand, Earthquake" by H. N. T. Razafindrakoto, B. A. Bradley, and R. W. Graves, *Bulletin of the Seismological Society of America*, 109(5): 2138.

[J11] R. Paolucci, F. Gatti, M. Infantino, **C.Smerzini**, A.G. Özcebe, and M. Stupazzini (2018) Broad-band ground motions from 3D physics-based numerical simulations using Artificial Neural Networks. *Bulletin of Seismological Society of America*, 103(3): 1272-1286.

[J12] R. Paolucci and **C.Smerzini** (2018) Empirical evaluation of peak ground velocity and displacement as a function of elastic spectral ordinates. *Earthquake Engineering and Structural Dynamics*, 47(1): 245-255.

[J13] **C.Smerzini** and K. Pitilakis (2018) Seismic risk assessment at urban scale from 3D physics-based numerical modeling: the case of Thessaloniki. *Bulletin of Earthquake Engineering*, 16(7): 2609-2631.

[J14] L. Evangelista, S. del Gaudio, **C.Smerzini**, A. d'Onofrio, G. Festa, I. Iervolino, L. Landolfi, R. Paolucci, A. Santo, and F. Silvestri (2017) Physics-based seismic input for engineering applications: a case study in the Aterno River valley, Central Italy. *Bulletin of Earthquake Engineering*, 15(7):2645-2671.

[J15] **C.Smerzini**, K. Pitilakis, and K. Hashemi (2017) Evaluation of earthquake ground motion and site effects in the Thessaloniki urban area by 3D finite-fault numerical simulations. *Bulletin of Earthquake Engineering*, 15(3):787-812.

[J16] J. R. Abraham, **C.Smerzini**, R. Paolucci, and C. G. Lai (2016) Numerical study on basin-edge effects in the seismic response of the Gubbio valley, Central Italy. *Bulletin of Earthquake Engineering*, 14(6):1437-1459.

[J17] R. Paolucci, I. Mazzieri, and **C.Smerzini** (2015) Anatomy of strong ground motion: near-source records and three-dimensional physics-based numerical simulations of the M_W 6.0 2012 May 29 Po Plain earthquake, Italy. *Geophysical Journal International*, 203(3): 2001-2020.

[J18] **C.Smerzini**, C. Galasso, I. Iervolino, and R. Paolucci (2014) Ground motion record selection based on broadband spectral compatibility. *Earthquake Spectra*, 30(4):1427-1448

[J19] Mazzieri, M. Stupazzini, R. Guidotti, and **C.Smerzini** (2013) SPEED: SPectral Elements in Elastodynamics with Discontinuous Galerkin: a non-conforming approach for 3D multi-scale problems. *International Journal for Numerical Methods in Engineering*, 95(12):991-1010

[J20] **C.Smerzini** and M. Villani (2012) Broadband numerical simulations in complex near-field geological configurations: the case of the 2009 M_W 6.3 L,ÄôAquila earthquake. *Bulletin of the Seismological Society of America*, 102(6):2436-2451

[J21] R. Guidotti, M. Stupazzini, **C.Smerzini**, R. Paolucci, and P. Ramieri (2011) Numerical study on the role of basin geometry and kinematic seismic source in 3D ground motion simulation of the 22 February 2011 M_W 6.2 Christchurch earthquake. *Seismological Research Letters*, 82(6):767-782.

[J22] **C.Smerzini**, R. Paolucci, and M. Stupazzini (2011) Comparison of 3D, 2D and 1D numerical approaches to predict long period earthquake ground motion in the Gubbio plain, Central Italy. *Bulletin of Earthquake Engineering*, 9(6):2007-2029.

[J23] F. Pacor, G. Ameri, D. Bindi, L. Luzi, M. Massa, R. Paolucci, and **C.Smerzini** (2011) Characteristics of strong ground motions from the L,ÄôAquila (M_W = 6.3) earthquake and its strongest aftershocks. *Bollettino di Geofisica Teorica ed Applicata*, 52(3):471-490

[J24] **C.Smerzini**, R. Paolucci, and M. Stupazzini (2009) Experimental and numerical results on earthquake-induced rotational ground motions. *Journal of Earthquake Engineering*, 13(S1):66-82.

[J25] **C.Smerzini**, J. Avilés, R. Paolucci, and F. J. Sánchez-Sesma (2009) Effect of underground cavities on surface earthquake ground motion under SH wave propagation. *Earthquake Engineering and Structural Dynamics*, 38(12):1441-1460.

[J26] G. Ameri, M. Massa, D. Bindi, E. D,ÄôAlema, A. Gorini, L. Luzi, S. Marzorati, F. Pacor, R. Paolucci, R. Puglia, and **C.Smerzini** (2009) The 6 April 2009 M_W 6.3 L,ÄôAquila (Central Italy) earthquake: strong-motion observations. *Seismological Research Letters*, 80(6):951-966.

[J27] L. Godinho, P. Amado Mendes, A. Tadeu, A. Cadena-Isaza, **C.Smerzini**, F. J. Sánchez-Sesma, R. Madec, and D. Komatitsch (2009) Numerical simulation of ground rotations along 2D topographical profiles under the incidence of elastic plane waves. *Bulletin of the Seismological Society of America*, 99(2B):1147-1161.

[J28] M. Stupazzini, J. de la Puente, **C.Smerzini**, M. Käser, H. Igel, and A. Castellani (2009) Study of rotational ground motion in the near-field region. *Bulletin of the Seismological Society of America*, 99(2B):1271-1286.

[J29] R. Paolucci, and **C.Smerzini** (2008) Earthquake-induced transient ground strains from dense seismic networks. *Earthquake Spectra*, 24(2):453-470.

Conference Proceedings

[C1] R. Paolucci, S. Sangaraju, and **C.Smerzini** Generating broadband ground motions from physics-based numerical simulations using Artificial Neural Networks, In *Proceedings of the 6th IASPEI / IAEE International Symposium: Effects of Surface Geology on Seismic Motion*, 30 August - 1 September 2021

[C2] S. Sangaraju, R. Paolucci, and **C.Smerzini** 3D Physics-based ground motion simulation of the 2016 Kumamoto earthquakes, In *Proceedings of the 6th IASPEI / IAEE International Symposium: Effects of Surface Geology on Seismic Motion*, 30 August - 1 September 2021

[C3] D. Soler Sandoval, **C.Smerzini**, S. Corciulo, and O. Zanoli (2019) Time domain numerical modelling of offshore wind turbines seismic response. In *Proceedings of the 7th International Conference on Earthquake Geotechnical Engineering*, Rome, 17-20 June 2019

[C4] A. G. Özcebe, **C.Smerzini**, R. Paolucci, H. Pourshayegan, R. Rodríguez Plata, C. G. Lai, E. Zuccolo, F. Bozzoni, and M. Villani (2019) On the comparison of 3D, 2D, and 1D numerical approaches to predict seismic site amplification: the case of Norcia basin during the M6.5 2016 October 30 earthquake. In *Proceedings of the 7th International Conference on Earthquake Geotechnical Engineering*, Rome, 17-20 June 2019

[C5] R. Rodríguez, **C.Smerzini**, C. G. Lai, E. Zuccolo, A. G. Özcebe, and F. Bozzoni (2019) A comparative study on time domain 1D/2D seismic ground response analysis of Norcia basin during the M6.5 2016 October 30 earthquake. In *Proceedings of the 7th International Conference on Earthquake Geotechnical Engineering*, Rome, 17-20 June 2019

[C6] M. Stupazzini, A. Allmann, M. Infantino, R. Paolucci, **C.Smerzini**, I. Mazzieri, R. Guidotti, and P. Gardoni (2019) Footprint based PSHA: The case of Christchurch, New Zealand. In *Proceedings of the 2019 Pacific Conference on Earthquake Engineering*, Auckland, 4-6 Apr 2019

[C7] O. Odabasi, P. F. Bazzurro, M. Infantino, **C.Smerzini**, and M. Stupazzini (2019) Scenario-based probabilistic seismic performance analysis of an archetypal tall building in Istanbul using real and physics-based synthetic earthquake ground motions. In *Proceedings of the SECED 2019 Conference*, Greenwich, 9-10 Sept. 2019

[C8] P. F. Antonietti, A. Ferroni, I. Mazzieri, R. Paolucci, A. Quarteroni, **C.Smerzini**, and M. Stupazzini (2018) Numerical modeling of seismic waves by discontinuous spectral element methods. In *43-ème Congrès National d'Analyse Numérique, CANUM2016 – ESAIM Proceedings and Surveys* - ISSN:2267-3059 vol. 61

[C9] **C.Smerzini** (2018) Spatial variability of earthquake ground motion from 3D physics-based numerical simulations. In *Proceedings of the 16th European Conference on Earthquake Engineering*, Thessaloniki, 18-21 June 2018.

[C10] **C.Smerzini**, F. Cavalieri, S. Argyroudis, and K. Pitilakis (2018) 3D physics-based numerical modeling as a tool for seismic risk assessment of urban infrastructural systems: the case of Thessaloniki, Greece. In *Proceedings of the 16th European Conference on Earthquake Engineering*, Thessaloniki, 18-21 June 2018.

[C11] I. Mazzieri, L. Melas, **C.Smerzini**, and M. Stupazzini (2018) The role of near-field ground motion on seismic risk assessment in large urban areas. In *Proceedings of the 16th European Conference on Earthquake Engineering*, Thessaloniki, 18-21 June 2018

[C12] V. Bhanu, A.G. Özcebe, and **C.Smerzini** (2018) A study on vertical component of earthquake ground motion and its effect on a bridge. In *Proceedings of the 16th European Conference on Earthquake Engineering*, Thessaloniki, 18-21 June 2018

[C13] K. Hashemi, and **C.Smerzini** (2018) Comparison of 1D vs 2D vs 3D numerical approaches for prediction of seismic ground motion and site effects in Thessaloniki urban area. In *Proceedings of the 16th European Conference on Earthquake Engineering*, Thessaloniki, 18-21 June 2018

[C14] M. Infantino, R. Paolucci, **C.Smerzini**, and M. Stupazzini (2018) Study of the Spatial Correlation of Earthquake Ground Motion By Means of Physics-Based Numerical Scenarios. In *Proceedings of the 16th European Conference on Earthquake Engineering*, Thessaloniki, 18-21 June 2018

[C15] M. Infantino, R. Paolucci, and **C.Smerzini** (2018) Analysis of the spatial correlation of earthquake ground motion from physics-based numerical simulations. In *Proceedings of the 2nd Workshop: Best Practices in Physics-based Fault Rupture Models for Seismic Hazard Assessment of Nuclear Installations: issues and challenges towards full Seismic Risk Analysis*, Cadarache, 14-16 May 2018

[C16] R. Paolucci, I. Mazzieri, A.G. Özcebe, **C.Smerzini**, M. Stupazzini, and M. Infantino (2017) 3D physics-based earthquake scenarios in Istanbul for seismic risk assessment. In *Proceedings of the 16th World Conference on Earthquake Engineering (16WCEE)*, number Paper N. 1478, Santiago, Chile, January 9-13 2017

[C17] M. Stupazzini, M. Infantino, A. Allmann, M. Käser, R. Paolucci, I. Mazzieri, and **C.Smerzini** (2017) PSHAe (Probabilistic Seismic Hazard Assessment enhanced): the case of Istanbul. In *Proceedings of the 16th World Conference on Earthquake Engineering (16WCEE)*, number Paper N. 1631, Santiago, Chile, January 9-13 2017

[C18] M. Stupazzini, M. Infantino, A. Allmann, M. Käser, I. Mazzieri, A.G. Özcebe, R. Paolucci, and **C.Smerzini** (2016) Near-fault earthquake ground-motion simulation in the Istanbul area. In *Proceedings of the 5th IASPEIIAEE International Symposium: Effects of Surface Geology on Seismic Motion (ESG5)*, Taipei, Taiwan, August 15-17 2016

[C19] **C.Smerzini**, K. Pitilakis, and K. Hashemi (2016) 3D numerical modelling of the seismic response of the Thessaloniki urban area: the case of the 1978 Volvi earthquake. In *Bulletin of the Geological Society of Greece - Proceedings of the 14th International Conference of the Geological Society of Greece (EGE2016)*, Thessaloniki, Greece, May 25-27 2016

[C20] O. Zanoli, **C.Smerzini**, and E.J. Parker (2016) Vertical input for seismic analysis of offshore structures. In *Proceedings of the 2016 Offshore Technology Conference (OTC 2016)*, number OTC-27140-MS, Houston, Texas, USA, May 2-5 2016

[C21] K. Hashemi, I. Mazzieri, R. Paolucci, and **C.Smerzini** (2015) Spatial variability of near-source seismic ground motion with respect to different distance metrics, with special emphasis on May 29 2012 Po Plain Earthquake, Italy. In *Proceedings of the 7th International Conference on Seismology and Earthquake Engineering (SEE7)*, Tehran, Iran, May 18-21 2015

[C22] M. Stupazzini, A. Allmann, M. Käser, I. Mazzieri, A.G. Özcebe, R. Paolucci, and **C.Smerzini** (2015) PSHAe (Probabilistic Seismic Hazard Analysis enhanced): the case of Istanbul. In *Proceeding of the 10th Pacific Conference on Earthquake Engineering (10PCEE)*, Syndney, Australia, November 6-8 2015

[C23] **C.Smerzini**, I. Mazzieri, and R. Paolucci (2015) 3D physics-based numerical simulations of the MW6 May 29 2012 Emilia earthquake. In *Proceedings of the Workshop on Best Practices in Physics-based Fault Rupture Models for Seismic Hazard Assessment of Nuclear Installations (BestPSHANI)*, Vienna, Austria, November 18-20 2015

[C24] M. G. Mulas, R. Pantalena, **C.Smerzini**, and D. Coronelli (2014). The assessment of an existing RC framed structure: a case study on a collapsed building. In *Proceedings of the IX International Conference on Structural Dynamics (EURODYN 2014)*, Porto, Portugal, June 30 - July 2 2014

[C25] R. Paolucci, M. Stupazzini, P. F. Antonietti, R. Guidotti, I. Mazzieri, **C.Smerzini**, and M. Beretta (2013). Deterministic seismic scenarios from 3D numerical simulations. In *Proceedings of the Vienna Congress on Recent Advances in Earthquake Engineering and Structural Dynamics 2013 (VEESD 2013)*, number 255, Vienna, Austria, August 28-30 2013

[C26] R. Guidotti, M. Stupazzini, **C.Smerzini**, and R. Paolucci (2012). The 22 February 2011 MW 6.3 Christchurch earthquake: 3D numerical simulations of strong ground motion. In *Proceedings of the 2nd International Conference on Performance Based Design in Earthquake Engineering (IIPBD)*, Taormina, Italy, May 28-30 2012

[C27] **C.Smerzini**, M. Villani, E. Faccioli, and R. Paolucci (2012). 3D numerical simulations in complex near-field geological configurations during the MW 6.3 L,ÄôAquila earthquake. In *Proceedings of the 15th World Conference on Earthquake Engineering (15WCEE)*, number 2362, Lisbon, Portugal, September 24-28 2012

[C28] **C.Smerzini**, R. Paolucci, C. Galasso, and I. Iervolino (2012). Engineering ground motion selection based on displacement-spectrum compatibility. In *Proceedings of the 15th World Conference on Earthquake Engineering (15WCEE)*, number 2354, Lisbon, Portugal, September 24-28 2012

[C29] J. R. Abraham and **C.Smerzini** (2012). Observed and simulated ground motions in the Gubbio basin, Central Italy during the MW 5.7 1984 earthquake. In *Proceedings of the 15th World Conference on Earthquake Engineering (15WCEE)*, number 3684, Lisbon, Portugal, September 24-28 2012

[C30] C. Cauzzi, D. Fäh, V. Pessina, E. Faccioli, and **C.Smerzini** (2012). Topographic amplification from recorded earthquake data and numerical simulations. In *Proceedings of the 15th World Conference on Earthquake Engineering (15WCEE)*, number 2341, Lisbon, Portugal, September 24-28 2012

[C31] R. Paolucci and **C.Smerzini** (2011). 3D numerical simulations of earthquake ground motion in sedimentary basins: the cases of Gubbio and L'Aquila, Central Italy. In *Proceedings of the 4th IASPEI / IAEE International Symposium on the Effects of Surface Geology on Seismic Motion*, Santa Barbara, USA, August 23-26 2011

[C32] I. Mazzieri, **C.Smerzini**, Paola F. Antonietti, F. Rapetti, M. Stupazzini, R. Paolucci, and A. Quarteroni (2011). Non-conforming spectral approximations for the elastic wave equation in heterogeneous media. In *ECCOMAS Thematic Conference: 3rd International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering (COMPDYN 2011)*, Corfú, Greece, May 26-28 2011

[C33] **C.Smerzini**, M. Stupazzini, and R. Paolucci (2011). Numerical simulation of seismic response at Gubbio basin, Central Italy. In *Proceedings of the 5th International Conference on Earthquake Geotechnical Engineering (5ICEGE)* Santiago, Chile, January 10-13 2011

[C34] R. Paolucci and **C.Smerzini** (2010) Strong ground motion in the epicentral region of the Mw 6.3 Apr 6 2009, L'Aquila earthquake, Italy. In *Proceedings of the 5th International Conference on Recent advances in Geotechnical Earthquake Engineering and Soil Dynamics*, number, EQ4, San Diego, California, USA, May 24-29 2010

[C35] E. Faccioli, M. Vanini, M. Villani, C. Cauzzi, and **C.Smerzini** (2010). Mapping seismic hazard to account for basin amplification effects. In *Proceedings of the 9th International Workshop on Seismic Microzoning Risk Reduction*, Cuernavaca, México, February 21-24 2010

[C36] **C.Smerzini**, J. Avilés, F. J. S´nchez-Sesma, and R. Paolucci (2008). Analytical solutions for the seismic response of underground structures under SH wave propagation. In *Proceedings of the 2008 Seismic Engineering International Conference commemorating the 1908 Messina and Reggio Calabria Earthquake (MERCEA 2008)*, volume I, pages 674-683, Reggio Calabria, Italy, July 8-11 2008

[C37] L. Scandella, **C.Smerzini**, and R. Paolucci (2008). Experimental and numerical study on earthquake-induced ground strains. In *Proceedings of the 14th World Conference on Earthquake Engineering*, number 06-0009, Beijing, China, October 12-17 2008

[C38] **C.Smerzini**, E. Faccioli, R. Paolucci, L. Scandella, and W.R Stephenson (2006). Surface ground strains evaluated from weak motion records of dense seismograph arrays: the case of Parkway Valley, New Zealand. In *Proceeding of the 1st European Conference on Earthquake Engineering and Seismology (1ECEES)*, number 879, Geneve, Switzerland, September 3-8 2006

Book Chapters

[B1] R. Paolucci, M. Infantino, I. Mazzieri, A.G. Özcebe, **C.Smerzini**, M. Stupazzini (2018). 3D physics-based numerical simulations: advantages and current limitations of a new frontier to earthquake ground motion prediction. The Istanbul case study. In *Pitilakis K. (eds) Recent Advances in Earthquake Engineering in Europe. ECEE 2018. Geotechnical, Geological and Earthquake Engineering*, vol 46. Springer

[B2] R. Paolucci, I. Mazzieri, **C.Smerzini**, and M. Stupazzini (2014). Physics-based earthquake ground shaking scenarios in large urban areas. In *A. Ansal, editor, Perspectives on European Earthquake Engineering and Seismology, Geotechnical, Geological and Earthquake Engineering*, volume 34. Springer.