

# Curriculum Vitae of Maria I. Todorovska

## Current Position and Affiliation

Adjunct Research Professor  
University of Southern California  
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Research Group Web Site: <http://earthquake-eng.usc.edu/>

## Specialty:

Earthquake Engineering, Engineering Seismology, Mechanics, Signal Processing

Topics: Structural system identification and health monitoring; Strong ground motion; Probabilistic seismic hazard and loss assessment; Wave propagation in soils and structures; Soil-structure interaction; Tsunami near field modeling

## Education

Ph.D. - 1988, University of Southern California (Civil Engineering)  
M.Sc. - 1985, University of Southern California (Civil Engineering)  
B.Sc. - 1982, Univ. St. Cyril & Methodius, Skopje, Macedonia (Physics)  
M.Sc. - 1988, University of Southern California (Applied Mathematics)  
M.Sc. - 2001, University of Southern California (Electrical Engineering)

## Academic Appointments

Univ. of Southern California, Dept. of Civil Engineering:

2014–	Adjunct Research Professor	1998– 2004	Research Associate Professor
2005– 2013	Research Professor;	1989 –1991	Research Associate
1992–1998	Research Assistant Professor;	1985 –1987	Teaching Assistant
1984–1987	Research Assistant;		

Univ. of Southern California, Dept. of Mathematics:

1987–1988 Teaching Assistant

Tokyo Science University, Dept. of Architecture:

March 2005 Visiting Professor

Tianjin University, School of Civil Engineering:

2015-2017 Visiting Professor

2017-2020 Tianjin 1000Person Plan Foreign Expert Professor

## Citation Statistics:

**Web of Science (Thompson ISI)** (as of 10/29/ 2019):

Entries: 113; Citations: 2,645, **h-index: 32**, citation/article: 23.42

**Google Scholar:** <http://scholar.google.com/citations?user=X9qcF3MAAAAJ&hl=en> (as of 02/03/ 2020):

Citations: 6,198; **h-index 46**; i10-index 129

## Awards and Honors

- Tianjin 1000 Person Plan Award for Foreign Experts (2017-2020)
- Named among *Top 20 Authors worldwide on the Special Topic – Earthquakes for the period 1993-2003* (one of only two earthquake engineers) by Institute of Scientific Information (Thompson ISI).
- Named among *Top 1% Authors in Engineering* for the period 1995-2011 by Institute of Scientific Information (Thompson ISI).
- Named among 18 prominent women in civil engineering in the paper "Presenting Female Role Models in Civil Engineering: An Outreach Activity to Help Teachers Overcome Their Misperceptions of Engineers", by Yin Kiong Hoh, *Int. J. Engineering Education*, Vol. 24, No. 4, pp. 817-824, 2008.
- Kapitza Medal awarded by Russian Academy of Natural Sciences, 2004.
- Foreign Member of Russian Academy of Natural Sciences, 2004.
- Listed in *Who's Who 2005-2006*, Strathmore, Westbury, NY.
- Listed in *America's Registry of Outstanding Professionals 2003-2004*, Westbury, NY.
- Listed in *Who's Who in America 2009*, Marquise, New Providence, NJ.
- Fall 1986 Best Teaching Assistant Award in the Dept. of Civil Engr., Univ. of Southern California.

## Membership in Professional Societies

- Seismological Society of America (SSA), member, 1988-2015; life member, 2016-.
- Earthquake Engineering Research Institute (EERI), member, 1993-.
- American Society of Civil Engineers (ASCE), member, 1998-.
- Society for Industrial Applications of Mathematics (SIAM), member, 1998-2009.
- Indian Society of Earthquake Technology (ISET), life member, 1998-.
- American Geophysical Union (AGU), member, 2006-.
- Consortium of Organizations for Strong-Motion Observation Systems, 2000-.

## Membership in Professional Committees and Journal Editorial Boards

- Editorial Board Member of *Soil Dynamics and Earthquake Engineering* (Elsevier Science), 2001-.
- Editorial Board Member of *Earthquake Spectra* (EERI), 2008-2014.
- Editorial Board Member of *Geofisica*, (U. Zagreb), 2016-.
- Guest Editor, *Bull. Seism. Soc. Am.*, Special Issue on "Rotational Seismology and Engineering Applications" (Lee WHK, Celebi M, Todorovska MI, Igel H eds.), May 2009.
- Guest Editor, *Frontiers in Built Environment*, Research Topic: Urban Vibrations & their Effects upon Built Heritage: Measurements, Characterization, & Simulations, January 201/2019.
- Member of Strong Motion Programs Board of Consortium of Organizations for Strong-Motion Observation Systems (COSMOS); 2002-.
- Member of Panel on Wind and Seismic Effects of U.S.-Japan Natural Resources Program, 2005-.
- Member of the Dynamics Committee, ASCE, Engineering Mechanics Division; 1996-.
- Member of Scientific Committee of 16<sup>th</sup> World Conference on Earthquake Engineering, Chile, 2017.

## Other Professional Service

- Organizer of First International Workshop on Rotational Seismology and Engineering Applications, Menlo Park, 2007.
- Organizer of Third and Fourth U.S.-Japan (UJNR) Workshop on Soil-Structure Interaction, Menlo Park, 2004; Tsukuba, 2007.
- Founding member of International Working Group on Rotational Seismology, 2006-.
- Organized sessions at World Conferences on Earthquake Engineering, European Conferences on Earthquake Engineering, ASCE conferences and AGU meetings.
- Reviewer of proposals for NSF, USGS, Science Foundations of New Zealand, Hong Kong, Cyprus, France and Switzerland.
- Reviewer of papers for technical journals:
  - Civil Eng.: ASCE J. Eng. Mech., ASCE J. Geotech. and Geoenviron. Eng., ASCE J. of Struct. Eng.,

- ASCE J. of Bridge Eng., Canadian J. Civil Eng., Structural Control and Health Monitoring, J. of Cultural Heritage.
- Seismology and Geophysics: Bull. Seism. Soc. Am., J. Geophysical Research, Geofísica Internacional, Natural Hazards,
  - Earthquake Eng.: Earthq. Eng. & Struct. Dyn, Earthquake Spectra, Soil Dyn.& Earthq. Eng., J. Earthquake Eng., Indian J. Earthq. Tech., Earthq. Eng. & Eng. Vib. Bull. Earthq. Eng.
  - Mechanics: J. Sound & Vib., J. Acoustic Soc. Amer., Archive of Applied Mechanics, Mechanics Research Communications, Acta Mechanica, J. of Vibration and Control, Engineering Analysis with Boundary Elements; Shock and Vibration
  - Electrical Eng.: IEEE Spectrum, IEEE Trans. Signal Processing.
- Foreign Member of Ph.D. Dissertation Committees, Dept. of Civil Eng., National Institute of Technology Karnataka, Surathkal, Mangalore:
    - Dissertation: “Structural response variation in tall RC chimneys incorporating flexibility of soil”, SV Jisha, Ph.D. 2014.
    - Dissertation: “Effect of soil stiffness on seismic response of reinforced concrete buildings with shear walls”, H K Chinmayi, Ph.D. 2015.
  - Foreign Member of Ph.D. Dissertation Committees, Dept. of Civil Eng., Indian Institute of Technology- Gandhinagar
    - Dissertation: “Characterization and Simulation of Spatially Varying Ground Motion”, Gopala Krishna Rodda, Ph.D. 2019

### University Service (USC)

- Member of Provost’s Committee on Academic Leadership and Advancement, 2005/2006.
- USC Ambassador, 2004-.
- Member of Mellon Mentoring Program Steering Committee, 2003/2004, 2004/2005.
- Member of Academic Senate Committee on Non-Tenure Track Faculty, 2002/2003, 2003/2004, 2004/2005, 2005/2006.
- Member of School of Engineering Faculty Council Committee on Rights and Responsibilities of Research Faculty, 2002/2003.
- Member of Academic Senate Committee in charge of producing a white paper on Non-Tenure Track Faculty, 2001/2002.
- Panellist of Research Faculty Forum, April 2002.
- Hosted visit of 2001/2002 Provost Distinguished Visitor – Prof. Francisco Jose Sánchez-Sesma of the Mexico National Autonomous University (UNAM).
- Civil Engineering Department Research Seminars Coordinator, 1998/1999 and 1999/2000.
- Prepared and graded Engineering Mathematics problems for Civil Engineering Department Screening Examination.
- Served on and chaired Qualifying Examination Committees.
- Served on Structural Curriculum Committee, Civil and Envir. Eng. Dept., 2014/2015.

### Research Experience

- Includes analysis of the effects of propagating earthquake waves on long buildings (without major discontinuities, with stiff shear walls at the ends, with stiff central core and with soft first floor), analytical solutions, 1987; effects of propagating waves on semi-circular dam structures, analytical solution, 1986; probabilistic description of attenuation of earthquake intensities in the Balkan region for probabilistic seismic risk, 1986; diffraction of plane seismic waves from shallow circular alluvium valleys, or soil deposits, for incident plane SH-, P- and SV-waves, and surface Rayleigh-waves, analytical solutions, 1988; foundation-soil and building-foundation-soil interaction for in-plane wave excitation; influence of the embedment on the system damping, system frequency, and system response amplitudes during soil-structure interaction, 1989-1990; source mechanism of the 1987 Whittier-Narrows earthquake using near-field strong motion data, 1989; scattering of plane seismic waves from shallow spherical canyons, closed-form solutions, 1989; scattering of plane SH-, P- and SV-waves from two-dimensional canyons and

valleys with irregular boundaries, 1990-1991; seismic hazard assessment, 1991-1992; probabilistic assessment of losses caused by earthquakes, 1991; passive isolation of buildings from strong earthquake ground motion: classical approach and innovative ideas, 1991-1992; energy transfer in buildings during building-foundation-soil interaction, 1992; generalization of seismic hazard assessment to peaks in responses of structures, 1993; frequency dependent duration of strong ground motion on the territory of former Yugoslavia, 1993; probabilistic seismic hazard assessment of ground motion: effects of source characteristics, attenuation with distance and local soil and geologic site conditions, 1993-1994; application of order statistics to functionals of strong ground motion, 1993-1994; 3-D soil-structure interaction for eccentric buildings, 1994; dynamic response of a solid waste deposit to earthquake wave motion, 1994; probabilistic modeling of liquefaction hazard in sands via energy and regression over observed data, 1994; analyses of strong ground motion during the Northridge, California, earthquake: distribution of peak acceleration, velocity, peak strain and PSV amplitudes, nonlinear soil response in relation to recorded peak accelerations, 1994-1996; analysis of damage during the Northridge, 1994, earthquake (red-tagged buildings, breaks in water pipes, fire outbreaks) in relation to recorded strong ground motion, 1996; probabilistic mapping of earthquake induced peak strains in soils and of liquefaction opportunity for specified exposure, 1995-1996; new developments in earthquake data processing: algorithms for instrument calibration and for correction of accelerograms recorded on film for misalignment and cross-axis sensitivity, 1995-1997; analyses of differential ground motion and effects on structures, 1995-; probabilistic hazard modeling of tsunami runup, 1997-; simulation of generation and propagation in the near-field of tsunami created by a source spreading with uniform velocity, 1997-; experimental analysis of response of full scale-structures to ambient noise and to strong earthquakes, 1997-; simulation of earthquake ground motion by explosions, 1998; identification of nonlinear soil-structure systems from recorded seismic response (Hilbert transform, Gabor transform and wavelet transform methods), 2000, 2003; interpretation of recorded earthquake response of buildings by wave propagation methods, 2000-; modeling and simulation of soil-structure interaction for structures on flexible foundations and with deformable structure-foundation and foundation-soil interfaces using wave expansion method, 2000-; modeling of generation and propagation in the near-field of tsunami created by submarine slides and slumps spreading with uniform velocity, with variable velocity, and with variable final uplift, 2001-2002; empirical estimation of maximum distance and minimum energy to initiate liquefaction in water saturated sands for probabilistic seismic hazard computations, 2002-2003; reoccurrence of damage zones—comparison of distribution of damage to buildings and to the water distribution system caused by the 1971 San Fernando and by the 1994 Northridge earthquakes, 2002-2003; exploration of the applicability and possible advantages of orthonormal wavelet bases representation of seismic vibration data—estimation of local and global aggregates and averages of energy, power, power spectrum density, cross-correlation, and cross-power spectrum density; dimensionality reduction and information granulation by thresholding and by lower resolution approximation and application to data mining, 2003; analysis of time and amplitude dependent variations of building frequencies during strong earthquake shaking for instrumented buildings in the Los Angeles area, estimated from recorded earthquake response, 2003-; probabilistic seismic hazard modeling of permanent displacement across earthquake faults for the transportation system, 2003-; structural health monitoring and damage detection using seismic monitoring arrays and wavelets, 2004; wave propagation and soil-structure interaction in poroelastic soils, 2005-; structural health monitoring and earthquake damage detection methodologies based on deconvolution interferometry, 2006-; multiresolution representation and approximation of strong ground motion database using wavelets, 2006-; instrument correction for 6DOF sensors, 2007-; generation of ensembles of artificial earthquake ground motions, 2006, 2012; extension of deconvolution interferometry to dispersive wave propagation, 2013-; wave propagation in periodic structures, 2014; coherency of strong ground motion, 2014-; Flood hazard, 2015-; Seismic array data processing, 2015-; soil-structure interaction for structures on flexible foundations, 2015-;

### Consulting Experience

- Has served as a consultant to government agencies, oil industry, land developers, consulting firms, and law firms on strong ground motion, seismic hazard assessment, and strong motion data processing.

### Other Selected Professional Experience

- Principal Investigator of the Los Angeles and Vicinity Strong Motion Network (1997-2006).
- Archiving and data processing of accelerograms recorded in the U.S. (Los Angeles Strong Motion Network, National Strong Motion Network, Los Angeles Department of Water and Power) and abroad (former Yugoslavia, Tadjikistan, India).

### Teaching Interests

- Undergraduate courses in Mechanics, Structures, Risk Analysis and Computer Methods.
- Graduate courses in Earthquake Engineering, Dynamics of Structures, Elasticity and Wave Propagation, Engineering Mathematics, and Probabilistic Methods.
- Organize new courses in Digital Signal Processing, Estimation Theory, and Information Management for Civil Engineering students.
- Promote education in Soil-Structure Interaction.

### Teaching Experience at USC

- CE 227 Statics and Strength of Materials (instructor, USC)
- CE 408 Risk Analysis (instructor, USC, Fall 2011)
- CE 402 Computer Methods in Engineering (instructor, USC, Spring 2016)
- CE 525b Engineering Analysis (instructor, USC, many times, most recently in Spring 2011)
- CE 535a,b Earthquake Engineering (taught selected lectures, USC)
- CE 227 Statics and Strength of Materials (teaching assistant, USC)
- CE 228 Dynamics (teaching assistant, USC)
- CE 525a,b Engineering Analysis (teaching assistant, USC)
- MATH 125 Calculus I (teaching assistant, USC)
- MATH 126 Calculus II (teaching assistant, USC)
- MATH 226 Calculus III (teaching assistant, USC)

### Teaching in International Short Courses

- Short course: 'Seismic Risk in India', December, 12-14, New Delhi, India; organized by Indian Inst. of Technology, Kanpur, Continuing Education Program. Course convener Prof. V.K. Gupta. Delivered three invited lectures; lecture notes published in course proceedings.
- Short Course on Analysis of Strong Motion Accelerograms in Geotechnical and Structural Engineering, Universidad Tecnológica de Panamá, Panama City, March 14-18, 2011. Host: Prof. Jaime Toral. Invited lectures on:
  - a. Strong motion instrumentation in buildings, Lesson 7a,b of
  - b. Fixed-base and rigid-body frequency of buildings, Lesson 8
  - c. Study of the Van Nuys building, Lesson 9
  - d. Earthquake damage detection in the ICS building, Lesson 10
  - e. System identification of tall buildings, Lesson 11
  - f. Future challenges and needs, Lesson 12
- Short Course and Workshop on Ambient Noise Imaging and Monitoring, organized by Michel Campillo, Eric Larose and Philippe Roux, Institut des Sciences de la Terre, Université Joseph Fourier, Grenoble, France, Cargese, Corsica, France, April 22<sup>nd</sup>-27<sup>th</sup>, 2013. Delivered invited lecture on "Wave methods for structural system identification and health monitoring of buildings".

### Ph.D. Students Advised at USC as Chair of Ph.D. Guidance and Dissertation Committee

- Yousef Saleh Al Rjoub, Ph.D. 2007; currently Associate Professor at Jordan University of Science and Technology. Dissertation: “Soil structure interaction in poroelastic soils”, May 2007.
- Mohammadtaghi Rahmani, Ph.D. Aug 2014; currently Assistant Professor, California State University, Long Beach. Dissertation: “Wave method for structural system identification and health monitoring of buildings based on layered shear beam model”, August 2014.
- Mahdi Ebrahimian Dehaghani, Ph.D. Aug 2015; VSoE Doctoral Fellow (2010-2014); Outstanding Research Assistant Award in Civil and Environmental Engineering for 2013/2014; currently Junior Engineer at Kleinfelder, San Diego. Dissertation: “Structural system identification and health monitoring of buildings by the wave method based on the Timoshenko beam model”, August 2015.

### Postdoctoral Fellows and Visiting Scholars Advised at USC

- A. Hayir, NATO Postdoctoral Fellow, 2000-2001; currently Professor at Istanbul Technical U.
- T.-Y. Hao, 2002-2004, Postdoc, currently Assist. Professor at California State Univ. Northridge.
- Aydin Ozmutlu, 2013-2014, Postdoc, TUBITAK Fellow; Assistant Professor of Civil Engineering, Namik Kemal University.
- Tomasz Falborski, March 1- July 31, 2014, visiting graduate student, currently Assistant Prof. at Gdansk Institute of Technology.
- Mina Sugino, Feb. 11-25, 2015, visiting graduate student, Kyoto University; currently Research Associate at Kyoto U.
- Qijian Liu, August 1-October 21, 2015, visiting scholar, Associate Prof. Hunan University.
- Jie Zhang, Sept. 2015 –2017, visiting scholar, Dalian U. of Technology, China.
- Saki Ohmura, February 4-22, 2019, visiting scholar, Kyoto U., Japan

### Graduate Students Co-advised at USC (jointly with M. Trifunac)

- S.S. Ivanovic (Ph.D., 1998; currently Professor at U. of Monte Negro), T.-Y. Hao (Ph.D., 2002; currently Assistant Professor at California State University-Northridge), V. Gičev (Ph.D., 2005; currently Professor and Dean of Engineering, University Goce Delčev in Štip, Macedonia), R. Taborda (M.S. 2005), Hadi Meidani (2005; currently Assist. Prof. U. Illinois at Urbana-Champaign), Fabian Rojas (Fulbright scholar, 2007; currently Assist. Prof. at U. Chile,).

### Computer Languages and Interpreters

- Fortran, C++, Visual Basic, Matlab, S-Plus.

### Foreign Languages

- English, French, Russian, Serbo-Croatian, Bulgarian and Macedonian (native).

### Scientific Publications

#### Journal Papers

1. Trifunac MD, **Todorovska MI** (1989). Attenuation of seismic intensity in Albania and Yugoslavia, *Earthquake Engrg & Struct. Dynamics*, **18**(5):617-631.
2. **Todorovska MI**, Trifunac MD (1989). Antiplane earthquake waves in long structures, *J. Engrg Mech.*, ASCE, **115**(12):2687-2708.
3. **Todorovska MI**, Lee VW (1989). Seismic waves in buildings with shear walls or central core, *J. Engrg Mech.*, ASCE, **115**(12):2669-2686.
4. **Todorovska MI**, Trifunac MD (1990). Propagation of earthquake waves in buildings with soft first floor, *J. Engrg Mech.*, ASCE, **116**(4):892-900.
5. **Todorovska MI**, Trifunac MD (1990). Note on excitation of long structures by ground waves, *J. Engrg*

- Mech.*, ASCE, **116**(4):952-964.
6. **Todorovska MI**, Lee VW (1990). A note on response of shallow circular valleys to Rayleigh waves: analytical approach, *Earthquake Engrg & Engrg Vibration*, **10**(1):21-34.
  7. **Todorovska MI**, Lee VW (1991). Surface motion of circular alluvial valleys of variable depth for incident plane SH waves, *Soil Dynamics & Earthquake Engrg*, **10**(4):192-200.
  8. **Todorovska MI**, Lee VW (1991). A note on scattering of Rayleigh waves by shallow circular canyons: analytical approach, *Bull. Indian Soc. Earthquake Tech.*, Paper No. 306, 28 (2), 1-16.
  9. **Todorovska MI**, Trifunac MD (1992). The system damping, the system frequency and the system response peak amplitudes during in-plane building-soil interaction, *Earthquake Engrg & Struct. Dynamics*, **21**(2):127-144.
  10. **Todorovska MI** (1992). Effect of the depth of the embedment on the system response during building-soil interaction, *Soil Dynamics & Earthquake Engrg*, **11**(2):111-123.
  11. **Todorovska MI** (1993). In-plane foundation-soil interaction for embedded circular foundations, *Soil Dynamics & Earthquake Engrg*, **12**(5):283-297.
  12. **Todorovska MI** (1993). Effects of the wave passage and the embedment depth for in-plane building-soil interaction, *Soil Dynamics & Earthquake Engrg*, **12**(6):343-355.
  13. **Todorovska MI**, Trifunac MD (1992). Effects of the base input rocking on the relative response of long buildings on embedded foundations, *European Earthquake Engrg*, Vol. VI-n.1, 36-46.
  14. Jordanovski LR, **Todorovska MI**, Trifunac MD (1992). The total loss in a building exposed to earthquake hazard, Part I: the model, *European Earthquake Engrg*, Vol. VI-n.3, 14-25.
  15. Jordanovski LR, **Todorovska MI**, Trifunac MD (1992). The total loss in a building exposed to earthquake hazard, Part II: a hypothetical example, *European Earthquake Engrg*, Vol. VI-n.3, 26-32.
  16. **Todorovska MI** (1994). Comparison of response spectrum amplitudes from earthquakes with lognormally and exponentially distributed return period, *Soil Dynamics & Earthquake Engrg*, **13**(2):97-116.
  17. **Todorovska MI** (1994). Order statistics of functionals of strong ground motion for a class of renewal processes, *Soil Dynamics & Earthquake Engrg*, **13**(6):399-405.
  18. **Todorovska MI** (1995). A note on distribution of amplitudes of peaks in structural response including uncertainties of the exciting ground motion and of the structural model, *Soil Dynamics & Earthquake Engrg*, **14**(3):211-217.
  19. Trifunac MD, **Todorovska MI**, Ivanovic SS (1994). A note on distribution of uncorrected peak ground accelerations during the Northridge, California, earthquake of 17 January 1994, *Soil Dynamics & Earthquake Engrg*, **13**(3):187-196.
  20. Novikova EI, **Todorovska MI**, Trifunac MD (1994). Frequency dependent duration of strong earthquake ground motion on the territory of former Yugoslavia, Part I: magnitude models, *European Earthquake Engrg*, Vol. VIII-n.3, 11-25.
  21. Novikova EI, **Todorovska MI**, Trifunac MD (1994). Frequency dependent duration of strong earthquake ground motion on the territory of former Yugoslavia, Part I: local intensity models, *European Earthquake Engrg*, Vol. VIII-n.3, 26-37.
  22. **Todorovska MI**, Lee VW (1995). A note on sensitivity of uniform probability spectra on modeling the fault geometry in areas with a shallow seismogenic zone, *European Earthquake Engrg*, Vol. IX-n.2, 14-22.
  23. Scientists of the U.S. Geological Survey and the Southern California Earthquake Center (1994). (Direct contribution made by: L. Jones, K. Aki, D. Boore, M. Celebi, A. Donnellan, J. Hall R. Harris, E. Hauksson, T. Heaton, S. Hough, K. Hudnut, K. Hutton, M. Johnston, W. Joyner, H. Kanamori, G. Marshall, A. Michael, J. Mori, M. Murray, D. Ponti, P. Reasenber, D. Schwartz, L. Seeber, A. Shakal, R. Simpson, H. Thio, J. Tinsley, **M. Todorovska**, M. Trifunac, D. Wald, M.L. Zobak.). The magnitude 6.7 Northridge, California, earthquake of 17 January 1994, *Science*, **226**:389-397.
  24. Trifunac MD, **Todorovska MI** (1996). Nonlinear soil response - 1994 Northridge, California, earthquake, *J. Geotech. Engrg*, ASCE, **122**(9):725-735.

25. **Todorovska MI** (1996). Liquefaction hazard assessment via seismic wave energy and SPT values, *European Earthquake Engrg*, Vol. X-n.2, 24-37.
26. **Todorovska MI**, Trifunac MD (1996). Seismic hazard model for peak strains in soils during strong earthquake shaking, *Earthquake Engrg & Engrg Vibration*, Vol. 16 supplement, 1-12.
27. Trifunac MD, **Todorovska MI**, Ivanovic SS (1996). Peak velocities and peak surface strains during the Northridge, California, earthquake of 17 January 1994, *Soil Dynamics & Earthquake Engrg*, **15**(5):301-310.
28. **Todorovska MI**, Trifunac MD (1996). Hazard mapping of normalized peak strain in soil during earthquakes: microzonation of a metropolitan area, *Soil Dynamics & Earthquake Engrg*, **15**(5):321-329.
29. Trifunac MD, **Todorovska MI** (1997). Response spectra for differential motion of columns, *Earthquake Engrg & Struct. Dynamics*, **26**(2):251-268.
30. Trifunac MD, **Todorovska MI** (1997). Northridge, California, earthquake of 1994: density of red-tagged buildings versus peak horizontal velocity and intensity of shaking, *Soil Dynamics & Earthquake Engrg*, **16**(3):209-222.
31. Trifunac MD, **Todorovska MI** (1997). Northridge, California, earthquake of 1994: density of pipe breaks and surface strains, *Soil Dynamics & Earthquake Engrg*, **16**(3):193-207.
32. **Todorovska MI**, Trifunac MD (1997). Distribution of pseudo spectral velocity during the Northridge, California, earthquake of 17 January 1994, *Soil Dynamics & Earthquake Engrg*, **16**(3):173-192.
33. **Todorovska MI**, Trifunac MD (1997). Amplitudes, polarity and time of peaks of strong ground motion during the 1994 Northridge, California, earthquake, *Soil Dynamics & Earthquake Engrg*, **16**(4):235-258.
34. Trifunac MD, **Todorovska MI** (1997). Closure by the authors of discussion of 'Nonlinear soil response - 1994 Northridge, California, earthquake' (September 1996, Vol. 122, No. 9 by M.D. Trifunac and M.I. Todorovska, Paper 9798), *J. Geotech. Engrg*, ASCE, **123**(10):989-990.
35. Trifunac MD, **Todorovska MI** (1998). Nonlinear soil response as a natural passive isolation mechanism - the 1994 Northridge, California, earthquake, *Soil Dynamics & Earthquake Engrg*, **17**(1):41-51.
36. Trifunac MD, **Todorovska MI** (1998). The Northridge, California, earthquake of 1994: fire ignition by strong shaking, *Soil Dynamics & Earthquake Engrg*, **17**(3):165-175.
37. Trifunac MD, **Todorovska MI**, Lee VW (1998). The Rinaldi strong motion accelerogram of the Northridge, California earthquake of 17 January 1994, *Earthquake Spectra*, **14**(1):225-239.
38. Trifunac MD, **Todorovska MI** (1998). Damage distribution during the 1994 Northridge, California, earthquake in relation to generalized categories of surficial geology, *Soil Dynamics & Earthquake Engrg*, **17**(4):238-252.
39. **Todorovska MI** (1998). Cross-axis sensitivity of accelerographs with pendulum like transducers: mathematical model and the inverse problem, *Earthquake Engrg & Struct. Dynamics*, **27**:1031-1051.
40. **Todorovska MI**, Novikova EI, Trifunac MD, Ivanovic SS (1998). Advanced sensitivity calibration of the Los Angeles Strong Motion Array, *Earthquake Engrg & Struct. Dynamics*, **27**:1053-1068.
41. **Todorovska MI**, Trifunac MD (1998). Discussion of 'The role of earthquake hazard maps in loss estimation: a study of the Northridge earthquake', by R.B. Olshansky, *Earthquake Spectra*, **14**(3):557-563.
42. **Todorovska MI** (1999). Base isolation by a soft first story with inclined columns, *J. of Engrg Mech.*, ASCE, **125**(4):448-457.
43. Trifunac MD, **Todorovska MI**, (1999). Reduction of structural damage by nonlinear soil response, *J. of Structural Engrg.*, ASCE, **125**(1):89-97.
44. Negmatullaev SKh, **Todorovska MI**, Trifunac MD (1999). Simulation of strong earthquake ground motion by explosions-experiments at the Lyaur testing range in Tajikistan, *Soil Dynamics & Earthquake Engrg*, **18**(3):189-207.
45. Trifunac MD, Ivanovic SS, **Todorovska MI** (1999). Experimental evidence for flexibility of a building foundation supported by concrete friction piles, *Soil Dynamics & Earthquake Engrg*, **18**(3):169-187.
46. **Todorovska MI**, Trifunac MD (1999). Liquefaction opportunity mapping via seismic wave energy, *J.*



- Geotechnical and Geoenvironmental Engrg*, ASCE, **125**(12):1032-1042.
47. Trifunac MD, Lee VW **Todorovska MI** (1999). Common problems in automatic digitization of accelerograms, *Soil Dynamics & Earthquake Engrg*, **18**:519-530.
  48. Trifunac MD, Hao TY, **Todorovska MI** (1999). On reoccurrence of site-specific response, *Soil Dynamics & Earthquake Engrg*, **18**(8):569-592.
  49. Trifunac MD, **Todorovska MI** (2000). Can aftershock studies predict site amplification? Northridge, CA, earthquake of 17 January 1994, *Soil Dynamics & Earthquake Engrg*, **19**(4):233-251.
  50. Trifunac MD, **Todorovska MI** (2000). Long period microtremors, microseisms and earthquake damage: Northridge, CA, earthquake of 17 January 1994, *Soil Dynamics & Earthquake Engrg*, **19**(4):253-267.
  51. Ivanović SS, Trifunac MD, E.I. Novikova, A.A. Gladkov, **Todorovska MI** (2000). Ambient vibration tests of a seven-story reinforced concrete building in Van Nuys, California, damaged by the 1994 Northridge Earthquake, *Soil Dynamics and Earthquake Engrg*, **19**(6):391-411.
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  20. **Todorovska MI**, Trifunac MD, Lee VW, Orbovic N (2012). Physical-empirical model for generation of multi-component synthetic ground motion time histories at closely spaced distances, *The 15<sup>th</sup> World Conference on Earthquake Engineering (15WCEE)*, Sept. 24-28, 2012, Lisbon, Portugal, oral.
  21. Trifunac MD, **Todorovska MI** (2012). Earthquake design spectra for performance-based design, *The 15<sup>th</sup> World Conference on Earthquake Engineering (15WCEE)*, Sept. 24-28, 2012, Lisbon, Portugal, oral.
  22. Gičev V, Trifunac MD, **Todorovska MI** (2012). Reduction of SH pulse by nonlinear soil strains and soil,

- The 15<sup>th</sup> World Conference on Earthquake Engineering (15WCEE)*, Sept. 24-28, 2012, Lisbon, Portugal, e-poster.
23. **Todorovska MI**, Trifunac MD, Lee VW (2013). Synthetic earthquake ground motions for the design of long structures, *Sixth China-Japan-US Trilateral Symposium on Lifeline Earthquake Engineering*, Chengdu, May 28 – June 1, 2013.
  69. Ebrahimian M, Rahmani M, **Todorovska MI** (2014). Wave method for system identification and health monitoring of buildings – extension to fitting Timoshenko beam model, *Proceedings of the 10<sup>th</sup> National Conference in Earthquake Engineering*, Anchorage, Alaska, July 21-25, 2014, Earthquake Engineering Research Institute, Oakland, CA. pp. 10. Poster presented by M. Ebrahimian.
  70. Ebrahimian M, **Todorovska MI** (2014). Structural system identification of buildings by a wave method based on a layered Timoshenko beam model, *Proceedings of SPIE Smart Structures and Materials + Nondestructive Evaluation and Health Monitoring Conference*, 9–13 March 2014, San Diego, CA, pp. 10. Oral, presented by M. Ebrahimian.
  71. **Todorovska MI**, Ozmutlu A, Ebrahimian M, (2015). Wave propagation in buildings as periodic structures: Timoshenko beam with slabs model and its application to structural system identification and health monitoring, *Seismological Society of America Annual Meeting*, Pasadena, CA, 21-25 April 2015, oral, presented by M. Todorovska.
  72. Rahmani M, Ebrahimian M, **Todorovska MI** (2015). Time-wave velocity analysis for early earthquake damage detection in buildings: application to a damaged full-scale RC Building, *Seismological Society of America Annual Meeting*, Pasadena, CA, 21-25 April 2015, poster, presented by M. Todorovska.
  73. Ebrahimian M, **Todorovska MI** (2015). Is ambient excitation as effective as the larger amplitude earthquake excitation for detecting earthquake damage in full-scale structures? Some results based on shake table tests of a full-scale 7-story building slice, *Seismological Society of America Annual Meeting*, Pasadena, CA, 21-25 April 2015, poster, presented by M. Ebrahimian.
  74. Zaccarelli L, **Todorovska M**, Ebrahimian M, Morelli A, Cavaliere A, Azzara R (2015). Monitoring two medieval towers through ambient seismic noise deconvolutions, 26<sup>th</sup> IUGG General Assembly 2015, Prague, Czech Republic, June 22-July 2, 2015. *International Union of Geophysics and Geodesy*, Poster, presented by L. Zaccarelli.
  75. **Todorovska MI**, Ding H, Trifunac MD (2016). Coherency of synthetic earthquake ground motion for the design of long structures: effect of site conditions, *Proceedings of the 7th China-Japan-United States Trilateral Symposium on Lifeline Earthquake Engineering*, Shanghai, China, June 1-4, 2016. Oral, presented by M. M. Todorovska.
  76. Rahmani M, Hao T-Y, **Todorovska MI**, Boroschek R (2017). Wave velocities in Torre Central building of University of Chile and their changes caused by M8.8 Maule Earthquake of 2010, *16th World Conf. on Earthquake Eng.*, Santiago, Chile, Jan. 9-13, 2017. Oral, presented by M. Todorovska.
  77. **Todorovska MI** (2017). Structural Health Monitoring as a Tool to Facilitate Early Post Earthquake Decision Making. *7th High-level (academician) Forum in the field of Hydraulic Engineering and the 2nd International Symposium on Hydraulic Engineering Simulation and Safety*, September 20 to 22, 2017, Tianjin, China. Invited talk.
  78. **Todorovska MI**, Ebrahimian M, Rahmani M (2017). Wave Method for Structural System Identification and Health Monitoring: Application to a Special Building, *Eighth European Workshop on the Seismic Behaviour of Irregular and Complex Structures*, 19-20 October 2017, Bucharest, Romania. Keynote lecture.
  79. **Todorovska MI**, Ozmutlu A., Ebrahimian M (2018). Wave propagation in high-rise buildings viewed as metamaterials, *EGU General Assembly 2018*, Vienna, Austria, April 8-13, 2018. Oral, Invited, presented by M. Todorovska.
  80. **Todorovska MI**, Ebrahimian M, Rahmani M (2018). Wave Method for Structural Health Monitoring: Review of Recent Developments, *11<sup>th</sup> National Conference on Earthquake Engineering*, Los Angeles, California, June 25-29, 2018, Oral, Invited, presented by M. Todorovska.

81. **Todorovska MI**, Ba Z, Ozmutlu A, Gao Z (2019). Excavations, hills and inclusions as seismic metamaterials: can they be used as wave barriers protecting structures from seismic and anthropogenic sources of vibrations? *Seism. Soc. America 2019 Annual Meeting (SSA2019)*, Seattle, Washington, USA, 23-26 April 2019. Technical Session: Metamaterials, Resonances and Seismic Wave Mitigation, an Emerging Trend in Seismology, Oral, invited, to be presented by M. Todorovska.

#### Invited Seminar Presentations and Lectures (2006-):

- Overview of the research by USC Strong Motion Group, Seminar, Keston Institute for Public Finance and Infrastructure Policy, University of Southern California, August 17, 2006.
- Earthquake damage detection in two buildings – comparative analysis of three structural health monitoring methods including a new wave method, Civil Engineering Seminar, University of Southern California, February 28, 2007.
- Earthquake damage detection in two buildings – comparative analysis of three structural health monitoring methods, Seminar, Department of System Design Engineering, Keio University, Japan, April 2, 2007.
- Earthquake damage detection in two buildings – comparative analysis of three structural health monitoring methods, International Seminar on Structural System Identification, Earthquake Disaster Research Laboratory, Disaster Control Research Center, Tohoku University, March 26, 2007.
- Earthquake damage detection in two buildings – comparative analysis of three structural health monitoring methods, Seminar, Rudarsko-Geoloski Fakultet, Stip, Makedonija, May 14, 2007.
- Specification of the seismic effects – from theory to applications, Lecture delivered as part of Short Course on Seismic Hazard Assessment and Mapping – Methodology and Examples, organized by Association of Civil Engineers of Serbia and magazine Izgradnja, Belgrade, Serbia, May 21, 2007.
- Structural models for rational design, structural health monitoring and seismic risk and loss assessment”, Earthquake Hazards Seminar, U.S. Geological Survey, Menlo Park, California, January 17, 2008. [ <mms://video.wr.usgs.gov/ehz/2008/20080117.wmv> ] <http://earthquake.usgs.gov/regional/nca/seminars/?year=2008>. Probabilistic description of ground motion for seismic design of highway bridges, METRANS Seminar, U. of Southern California, March 26, 2008.
- The role of soil-structure interaction in structural system identification and health monitoring. Lecture delivered as part of short course on Soil-Structure Interaction, organized by Association of Civil Engineers of Serbia and magazine Izgradnja, Belgrade, Serbia, June 23, 2008.
- The role of soil-structure interaction in structural system identification and health monitoring. Lecture delivered at Civil Engineering Department of Univ. St. Cyril and Methodius, Skopje, Macedonia, June 17, 2008.
- Intermediate scale wave method for structural health monitoring and its application to earthquake response data recorded in full-scale buildings. Seminar, Institute of Engineering Mechanics, Chinese Earthquake Administration, Harbin, China, October 22, 2008.
- Intermediate scale wave method for structural health monitoring and its application to earthquake response data recorded in full-scale buildings. Seminar, Civil Engineering Department, Tianjin Univ., Tianjin, China, October 23, 2008.
- Identification of buildings using a wave method. Seminar, Institute of Engineering, Universidad Nacional Autonoma de Mexico (UNAM), March 10, 2011.
- Short Course on Analysis of Strong Motion Accelerograms in Geotechnical and Structural Engineering, Universidad Tecnológica de Panamá, Panama City, March 14-18, 2011.
  - a. Strong motion instrumentation in buildings, Lesson 7a,b of
  - b. Fixed-base and rigid-body frequency of buildings, Lesson 8
  - c. Study of the Van Nuys building, Lesson 9
  - d. Earthquake damage detection in the ICS building, Lesson 10



- e. System identification of tall buildings, Lesson 11
- f. Future challenges and needs, Lesson 12
- Structural system identification and earthquake damage detection in buildings based on a wave propagation model, 5th Scientific Research Gathering “Experiences and Learning from the Earthquake that Struck Kraljevo on 3rd of November 2010” June 2-3, 2011, Kraljevo, Srbija.
- Artificial earthquake ground motions on an array for the design of long structures, VI Scientific Research Gathering “Design of Lifeline Systems in Seismic Regions”, organized by Izgradnja, June 15, 2012, Belgrade, Srbija.
- Artificial earthquake ground motions on an array for the design of long structures, lecture at Institute for Rebuilding of Banja Luka, 16 Juli 2012, Banja Luka, Republic of Srpska.
- Recent advances in wave travel time based methodology for structural health monitoring and early earthquake damage detection in buildings, seminar, Universidade do Porto, Faculdade de Engenharia, Portugal, October 1, 2012.
- Structural health monitoring and damage detection based on wave propagation methodology, seminar, Laboratório Nacional de Engenharia Civil (LNEC), Lisboa, Portugal, October 3, 2012.
- Structural health monitoring and damage detection based on wave propagation methodology, seminar, Kinematics Inc., Pasadena, CA, April 16, 2013.
- Wave methods for structural system identification and health monitoring of buildings, invited lecture presented at Ambient Noise Imaging and Monitoring, short course and workshop organized by Michel Campillo, Eric Larose and Philippe Roux, Institut des Sciences de la Terre, Université Joseph Fourier, Grenoble, France, Cargese, Corsica, France, April 22<sup>nd</sup>-27<sup>th</sup>, 2013.
- Wave method for structural health monitoring and early earthquake damage detection in buildings, lecture, Hunan University, Changsha, China, May 27, 2013.
- Probabilistic Flood Hazard and Risk Analysis for the Balkan Countries - Conceptual Framework, invited lecture presented at IX Scientific Meeting, dedicated to Causes and Consequences of the Catastrophic Floods of 2014 in Serbia – Rainfall, Erosion, Floods, Flush Floods, Slides and Earthquakes, organized by Izgradnja, Belgrade, 25 June, 2015.
- Wave Imaging of Buildings for structural health monitoring, Rapid Fire Conference @ MIT, honoring Prof. Eduardo Kausel, by invitation only, Cambridge, Massachusetts, Oct. 26, 2015.
- Wave Imaging of Buildings for structural health monitoring, Guest Professor Inaugural Lecture, Tianjin U., China, May 22, 2016.
- Wave Imaging of Buildings for structural health monitoring, Lecture, Nanjing Tech U., Nanjing, China, May 31, 2016.
- Wave Imaging of Buildings for structural health monitoring, Lecture, U. of Guilan, Rasht, Iran, July 24, 2016.
- Synthetic earthquake ground motion for the design of long structures, Lecture, U. of Guilan, Rasht, Iran, July 25, 2016.
- Coherency of synthetic earthquake ground motion at small separation distances: effects of site conditions, Lecture, U. of Guilan, Rasht, Iran, July 25, 2016.
- Wave method for structural system identification and health monitoring, Lecture, Invited, Yunnan Earthquake Agency, Kunming, Yunnan, China, January 9, 2018.
- Wave method for structural system identification and health monitoring – recent developments, Lecture, Invited; Institute of Earthquake Engineering and Engineering Seismology (IZIIS), Skopje, Republic of Macedonia, <http://www.iziis.edu.mk/>, February 14, 2018.
- Wave method for structural system identification and health monitoring - review of recent developments. Lecture, Invited; Instituto Nazionale di Geofisica e Vulcanologia (INGV), Bologna, Italy, <http://www.ingv.it/>; April 16, 2018.



- Wave method for structural system identification and health monitoring - review of recent developments. Lecture, Invited; BRGM – The French Geological Survey; Orléans, France; <http://www.brgm.eu/>, April 17, 2018.
- Wave imaging of structures and its use for monitoring the structural health: recent developments and outstanding challenges, Keynote invited lecture presented at 2<sup>nd</sup> *SEG Rock Physics Workshop: Challenges in Deep and Unconventional Oil/Gas Exploration*, 25–27 October 2019 | Qingdao, China, under the auspices of Society of Exploration Geophysics, Tulsa, Oklahoma, US. [https://seg.org/Portals/0/SEG/Events/2019\\_2nd\\_Rock\\_Geophysics/Rock\\_Physics\\_Official\\_Program.pdf](https://seg.org/Portals/0/SEG/Events/2019_2nd_Rock_Geophysics/Rock_Physics_Official_Program.pdf)

### Organization of Workshops and Conference Sessions (past few years only):

1. Celebi M, **Todorovska MI**, Okawa I, Iiba M. (organizers), *Third UJNR Workshop on Soil-Structure Interaction*, March 29-30, 2004, Menlo Park, California. Principal Investigator of NSF grant to organize this meeting. [[http://www.usc.edu/dept/civil\\_eng/Earthquake\\_eng/Proc/](http://www.usc.edu/dept/civil_eng/Earthquake_eng/Proc/)]
2. **Todorovska MI**, P. Lestuzzi (session chairs), Debate session: STS10: By how much does the natural frequency of structures decrease during seismic response? *First European Conference on Earthquake Engineering and Seismology*, Geneva, Switzerland, 3-8 September 2006.
3. Lee WHK, Igel H, **Todorovska MI**, Evans JR (session chairs), Special Session S22A: Rotational Motions in Seismology, *2006 AGU Fall Meeting*, San Francisco, California, 11-15 December, 2006. [<http://pubs.usgs.gov/of/2007/1263/>]
4. Okawa I, Iiba M, Celebi M, **Todorovska MI**. *Fourth UJNR Workshop on Soil-Structure Interaction*, March 29-31, 2007, Tsukuba, Japan. Principal Investigator NSF travel grant for US team to attend this meeting.
5. Lee WHK, Celebi M, **Todorovska MI** (organizers), First International Workshop on Rotational Seismology and Engineering Applications, Menlo Park, California, U.S.A.—September 18 to 19, 2007, hosted by U.S. Geological Survey. [<http://pubs.usgs.gov/of/2007/1144/>]
6. Graizer V, **Todorovska MI** (organizers). Rotations in strong-motion seismology, Special Session of SSA 2012, Seismological Society of America Annual Meeting, San Diego, CA, 17-19 April, 2012.
7. **Todorovska MI**, Philippe Gueguen (organizers). Structural Health Monitoring and Earthquake Damage Detection in Structures, Special Session of SSA 2015, Seismological Society of America Annual Meeting, Pasadena, CA, 21-25 April, 2015.
8. Kohler M, **Todorovska MI**, Ebrahimian H (organizers). "Integrating structural health monitoring and damage identification with post-disaster decision making and emergency response management", special session at 11<sup>th</sup> National Conference on Earthquake Engineering, June 25-29, 2018, Los Angeles, CA.

### Strong Motion Data Releases on the WWW

1. Strong motion building response data of the Northridge earthquakes of January 17, 1994, and its aftershocks from the archives of the National Strong Motion Program, recorded in seven USGS and “code” buildings, URL: [www.usc.edu/dept/civil\\_eng/Earthquake\\_eng/USGS\\_build/](http://www.usc.edu/dept/civil_eng/Earthquake_eng/USGS_build/) (2004, 2005, funded by USGS).
2. Strong ground motion data of  $M_L=7.0$  Hector Mine earthquake of October 16, 1999 recorded at stations of the Los Angeles Strong Motion Network, URL: [www.usc.edu/dept/civil\\_eng/Earthquake\\_eng/Hector\\_eq/](http://www.usc.edu/dept/civil_eng/Earthquake_eng/Hector_eq/) (1999, funded by NSF).
3. Strong ground motion data of  $M_L=6.4$  Northridge earthquake of January 17, 1994, and five  $M>5$  aftershocks recorded at USC, USGS and DWP stations, URL: [www.usc.edu/dept/civil\\_eng/Earthquake\\_eng/North\\_M5/](http://www.usc.edu/dept/civil_eng/Earthquake_eng/North_M5/) (digitized and processed strong ground motion data 1999, funded by USGS).
4. Strong ground motion data of  $M_L=6.4$  Northridge earthquake of January 17, 1994, recorded at stations of the Los Angeles Strong Motion Network, URL: <ftp://cwis.usc.edu/pub/todorovs/Northridge> (1995, funded by USGS and NSF).

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**Theses**

- Ph.D. Thesis: 'Investigation of earthquake response of long buildings', Feb. 1988, presented to the Graduate School, Univ. of Southern California, in partial fulfillment of the requirements for Ph.D. degree in Civil Engineering.
- M.Sc. Thesis: 'Surface motion of circular alluvial valleys of variable depth for incident plane SH waves', Dec. 1988, presented to the Graduate School, University of Southern California, in partial fulfillment of the requirements for M.Sc. degree in Applied Mathematics.

**Graduate Advisors**

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