List of publications

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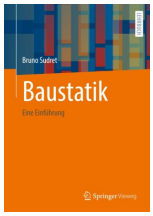
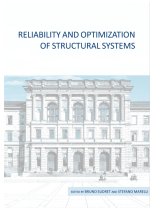
Books

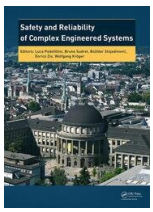


Sudret, B. (2022)
Baustatik – Eine Einführung, Springer Verlag. 378 pages.
ISBN: 978-3-658-35254-7

Edited Books



Sudret, B. and Marelli, S. (Eds.) (2019)
Reliability and Optimization of Structural Systems, Proceedings of the 19th Conference of the IFIP Working Group 7.5 (IFIP 2018). ETH Zurich (203 pages).
ISBN: 978-3-906916-56-9



Podofillini, L., Sudret, B., Stojadinovic, B., Zio, E. and Kröger, W. (Eds.) (2015)
Safety and Reliability of Complex Engineered Systems (ESREL 2015). CRC Press (730 pages).
ISBN: ISBN 978-1-138028-79-1.

Monographs and Textbooks

[1] Sudret, B. (2017). Introduction à la mécanique des structures. ETH Zurich (270 pages).

[2] Sudret, B. (2007). Uncertainty propagation and sensitivity analysis in mechanical models – Contributions to structural reliability and stochastic spectral methods. Habilitation à diriger des recherches, Université Blaise Pascal, Clermont-Ferrand, France (229 pages). [PDF]

[3] Sudret, B. and Der Kiureghian, A. (2000). *Stochastic finite elements and reliability: a state-of-the-art report*. Technical Report UCB/SEMM-2000/08, University of California, Berkeley (173 pages). [PDF]

[4] Sudret, B. (1999). *Modélisation multiphasique des ouvrages renforcés par inclusions*. Ph.D. thesis, Ecole Nationale des Ponts et Chaussées (364 pages). [PDF]

Book chapters

[1] Le Gratiet, L., Marelli, S. and Sudret, B. (2017). *Metamodel-based sensitivity analysis: Polynomial chaos expansions and Gaussian processes*. Handbook on Uncertainty Quantification, R. Ghanem, D. Higdon, H. Owhadi (Eds.), Springer.

[2] Sudret, B. (2014). *Polynomial chaos expansions and stochastic finite element methods*. Risk and Reliability in Geotechnical Engineering, chapter 6 (K.K. Phoon, J. Ching (Eds.)), pp. 265–300. Taylor and Francis.

[3] Duprat, F., Schoefs, F. and Sudret, B. (2011). *Physical and polynomial response surfaces*. Construction reliability – *safety, variability and sustainability*, chapter 7 (J. Baroth, F. Schoefs, and D. Breysse (Eds)), pp. 123–146. ISTE/Wiley.

[4] Sudret, B., Blatman, G. and Berveiller, M. (2011) *Response surfaces based on polynomial chaos expansions*. Construction reliability *Safety, variability and sustainability*, chapter 8 (J. Baroth, F. Schoefs, and D. Breysse (Eds)), pp. 147–168. ISTE/Wiley.

[5] Sudret, B. (2011) *Time-variant reliability problems*. Construction reliability *Safety, variability and sustainability*, chapter 10 (J. Baroth, F. Schoefs, and D. Breysse (Eds)), pp. 187–206. ISTE/Wiley.

[6] Sudret, B. (2011) *Bayesian updating techniques in structural reliability*. Construction reliability *Safety, variability and sustainability*, chapter 12 (J. Baroth, F. Schoefs, and D. Breysse (Eds)), pp. 227–248. ISTE/Wiley.

[7] Duprat, F., Schoefs, F. and Sudret, B. (2011). *Surfaces de réponse physiques et polynomiales*. Fiabilité des ouvrages, Traité "Mécanique et Ingénierie des Matériaux", chapter 7 (J. Baroth, F. Schoefs, and D. Breysse (Eds)), pp. 165–193. Editions Hermès.

[8] Sudret, B., Blatman, G. and Berveiller, M. (2011). *Surfaces de réponse par chaos polynomial*. Fiabilité des ouvrages, Traité "Mécanique et Ingénierie des Matériaux", chapter 8 (J. Baroth, F. Schoefs, and D. Breysse (Eds)), pp. 195–217. Editions Hermès.

[9] Sudret, B. (2011). *Approches probabilistes de la fiabilité dans le temps*. Fiabilité des ouvrages, Traité "Mécanique et Ingénierie des Matériaux", chapter 10 (J. Baroth, F. Schoefs, and D. Breysse (Eds)), pp. 237–256. Editions Hermès.

[10] Sudret, B. and Perrin, F. (2011). *Actualisation de la fiabilité par le retour d'expérience*. Fiabilité des ouvrages, Traité "Mécanique et Ingénierie des Matériaux", chapter 12 (J. Baroth, F. Schoefs, and D. Breysse (Eds)), pp. 275–295. Editions Hermès.

[11] Sudret, B. (2011). *Probabilistic design of structures submitted to fatigue*, Fatigue of materials and structures, chapter 5 (C. Bathias and A. Pineau (Eds)), pp. 223–263. Wiley & Sons.

[12] Sudret, B. (2008). *Approche probabiliste du dimensionnement à la fatigue des structures*. Fatigue des matériaux et des structures, Traité "Mécanique et Ingénierie des Matériaux", volume 3, chapter 5 (C. Bathias and A.-G. Pineau (Eds)), pp. 257–297. Editions Hermès.

[13] Sudret, B. and Berveiller, M. (2007). *Stochastic finite element methods in geotechnical engineering* Reliability-based design in geotechnical engineering: computations and applications, chapter 7 (K.K. Phoon (Ed.)), pp. 260–297. Taylor and Francis.

Refereed Journal papers

[1] Galimshina, A., Moustapha, M., Hollberg, A., Lasvaux, S., Sudret, B. and Habert, G. (2024). Recommendations for robust renovation strategies of Swiss residential buildings. *Nature Communications*. https://www.researchsquare.com/article/rs-2635161/v1. (Accepted).

[2] Giannoukou, K., Marelli, S. and Sudret, B. (2024). A comprehensive framework for multi-fidelity surrogate modeling with noisy data: a gray-box perspective. https://arxiv.org/abs/2401.06447. (Submitted).

[3] Moustapha, M., Parisi, P., Marelli, S. and Sudret, B. (2024). Reliability analysis of arbitrary systems based on active learning and global sensitivity analysis. https://arxiv.org/abs/2305.19885. (submitted).

[4] Pires, A., Moustapha, M., Marelli, S. and Sudret, B. (2024). Reliability analysis for data-driven noisy models using active learning. https://arxiv.org/abs/2401.10796. (Submitted).

[5] Schäer, S., Marelli, S. and Sudret, B. (2024). Emulating the dynamics of complex systems using autoregressive models on manifolds (mNARX). *Mechanical Systems and Signal Processing*, **208**(110956). https://doi.org/10.1016/j.ymssp.2023.110956.

[6] Del Giudice, L., Marelli, S., Sudret, B. and Vassiliou, M. (2023). Global sensitivity analysis of 3D printed material with binder jet technology by using surrogate modeling and polynomial chaos expansion. *Progress in Additive Manufacturing*. https://doi.org/10.1007/s40964-023-00459-y.

[7] Lüthen, N., Marelli, S. and Sudret, B. (2023). A spectral surrogate model for stochastic simulators computed from trajectory samples. *Computer Methods in Applied Mechanics and Engineering*, **406**(115875), pp. 1–29. https://doi.org/10.1016/j.cma.2022.115875.

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[9] Moustapha, M. and Sudret, B. (2023). Learning non-stationary and discontinuous functions using clustering, classification and Gaussian process modelling. *Computers & Structures*, **281**(107035). https://doi.org/10.1016/j.compstruc.2023.107035.

[10] Rouzies, E., Lauvernet, C., Sudret, B. and Vidard, A. (2023). How is a global sensitivity analysis of a catchment-scale,distributed pesticide transfer model performed? Application to the PESHMELBA model. *Geoscientific Model Development*, **16**(11), pp. 3137–3163. https://doi.org/10.5194/gmd-16-3137-2023.

[11] Wilson, P., Saintier, N., Palin-Luc, T., Sudret, B. and Bergamo, S. (2023). Statistical study of the size and spatial distribution of defects in a cast aluminium alloy for the low fatigue life assessment. *International Journal of Fatigue*, **166**(107206), pp. 1–24. https://doi.org/10.1016/j.ijfatigue.2022.107206.

[12] Zhu, X. and Sudret, B. (2023). Stochastic polynomial chaos expansions to emulate stochastic simulators. *International Journal for Uncertainty Quantification*, **13**(2), pp. 31–52. https://doi.org/10.1615/Int.J.UncertaintyQuantification.2022042912.

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International Conference Papers and Talks

[1] Brunel, L., Balesdent, M., Brevault, L., Le Riche, R. and Sudret, B. (2023). A review of multi-fidelity surrogate models for high-dimensional field outputs. In *Proc. 6th International Workshop on Model Reduction Techniques, Université Paris-Saclay, November 22-24*. (Poster).

[2] Giannoukou, K., Marelli, S. and Sudret, B. (2023). Constructing confidence and prediction intervals for multifidelity surrogate models involving noisy data. In *Proc. 5th Int. Conf. Uncertainty Quantification in Computational Sciences and Engineering (UNCECOMP'2023), Athens (Greece), June 12-14*. (Talk given by K. Giannoukou).

[3] Giannoukou, K., Marelli, S. and Sudret, B. (2023). Grey-box multifidelity surrogate modelling to combine noisy measurements and computer simulations. In *MascotNum Annual Meeting, Le Croisic, France, April 3-6*. (Poster).

[4] Groslambert, M., Jacot-Descombes, G., Commend, S. and Sudret, B. (2023). Sensitivity and reliability analyses applied to day-to-day geotechnical engineering using meta-models coupled with 3D finite elements. In A. O'Connor and V. Pakrashi (Eds.), *Proc. 14th Int. Conf. Applications of Statistics and Probability in Civil Engineering (ICASP14), Dublin (Ireland)*, Paper #172. http://hdl.handle.net/2262/103302.

[5] Hlobilová, A., Lataniotis, C., Marelli, S. and Sudret, B. (2023). UQLab & UQ[py]Lab – Project updates and outlook. In *Proc. 5th Int. Conf. Uncertainty Quantification in Computational Sciences and Engineering (UNCECOMP'2023), Athens (Greece), June 12-14*. (Talk given by A. Hlobilová).

[6] Parisi, P., Moustapha, M., Marelli, S. and Sudret, B. (2023). Active-learning-based system reliability analysis with budget constraints. In A. O'Connor and V. Pakrashi (Eds.), *Proc. 14th Int. Conf. Applications of Statistics and Probability in Civil Engineering (ICASP14), Dublin (Ireland)*, Paper #263. http://hdl.handle.net/2262/103372.

[7] Pires, A., Moustapha, M., Marelli, S. and Sudret, B. (2023). Defining what is a probability of failure for systems modelled by stochastic simulators. In *Proc. 5th Int. Conf. Uncertainty Quantification in Computational Sciences and Engineering (UNCECOMP'2023), Athens (Greece), June 12-14*. (Talk given by A. Pires).

[8] Pires, A., Moustapha, M., Marelli, S. and Sudret, B. (2023). Surrogate-based reliability analysis for noisy models. In A. O'Connor and V. Pakrashi (Eds.), *Proc. 14th Int. Conf. Applications of Statistics and Probability in Civil Engineering (ICASP14), Dublin (Ireland)*, Paper #420. http://hdl.handle.net/2262/103570.

[9] Schär, S., Marelli, S. and Sudret, B. (2023). A data-driven surrogate model for uncertainty quantification of dynamical systems. In *Proc. 5th Int. Conf. Uncertainty Quantification in Computational Sciences and Engineering (UNCECOMP'2023), Athens (Greece), June 12-14*. (Talk given by S. Schär).

[10] Schär, S., Marelli, S. and Sudret, B. (2023). mNARX – A novel surrogate model for the uncertainty quantification of dynamical systems. In *Proc. 9th Int. Conf. Structural Dynamics (EURODYN 2023), Delft, The Netherland, July 2-5*. https://www.research-collection.ethz.ch/handle/20.500.11850/621798. (Talk given by S. Schär).

[11] Schär, S., Marelli, S. and Sudret, B. (2023). Reliability analysis of wind turbines using manifold-NARX surrogate models. In *Proc. Engineering Mechanics Institute Conference (EMI'2023), University of Palermo (Italy), August 27-30*. (Talk given by B. Sudret).

[12] Ehre, M., Papaioannou, I., Straub, D. and Sudret, B. (2022). Sequential active learning of low-dimensional model representations for rare event estimation. In *SIAM Conf. on Uncertainty Quantification, Atlanta, GA (USA), April 12-15*. (Talk given by M. Ehre).

[13] Galimshina, A., Moustapha, M., Hollberg, A., Wagner, G., Padey, P., Lasvaux, S., Sudret, B. and Habert, G. (2022). Earth plastered wall heating as a low-emitting, cost-effective and robust energy system for building renovation. In *Construction Technologies and Architecture*, volume 1, pp. 466–471.

[14] Lataniotis, C., Marelli, S. and Sudret, B. (2022). UQLab 2.0 and UQCloud: open-source vs. cloud–based uncertainty quantification tools. In *SIAM Conf. on Uncertainty Quantification, Atlanta, GA (USA), April 12-15*. (Talk given by B. Sudret).

[15] Lauvernet, C., Helbert, C., Zhu, X. and Sudret, B. (2022). Metamodeling approaches to help designing vegetative filter strips and improve the water quality. In *Proc. EGU General Assembly, Vienna (Austria), May 23-27*. (Talk given by C. Lauvernet).

[16] Lauvernet, C., Helbert, C., Zhu, X. and Sudret, B. (2022). Metamodeling methods that incorporate qualitative variables for improved design of vegetative filter strips. In *10th Int. Conf. Sensitivity Analysis of Model Output (SAMO'2022), Florida State University, Tallahassee, FL (USA), March 14-16*. (Poster).

[17] Lüthen, N., Roustant, O., Gamboa, F., Iooss, B., Marelli, S. and Sudret, B. (2022). Poincaré chaos expansions for global sensitivity analysis and surrogate modelling. In *10th Int. Conf. Sensitivity Analysis of Model Output (SAMO'2022), Florida State University, Tallahassee, FL (USA), March 14-16*.

[18] Lüthen, N., Marelli, S. and Sudret, B. (2022). Surrogating stochastic simulators from sample trajectories using a non-Gaussian random field approach. In *SIAM Conf. on Uncertainty Quantification, Atlanta, GA (USA), April 12-15*. (Talk given by N. Lüthen).

[19] Moustapha, M. and Sudret, B. (2022). Multi-objective robust optimization using adaptive Kriging for problems with mixed continuous-categorical variables. In *SIAM Conf. on Uncertainty Quantification, Atlanta, GA (USA), April 12-15*. (Talk given by M. Moustapha).

[20] Moustapha, M., Marelli, S. and Sudret, B. (2022). Benchmark of active learning methods for structural reliability analysis. In *Proc. 15th Int. Conf. Monte Carlo and Quasi-Monte Carlo Methods in Scientific Computing (MCQMC), Linz (Austria), July 17–22*. (Talk given by M. Moustapha).

[21] Moustapha, M. and Sudret, B. (2022). A global framework for active learning reliability in UQLab. In J. Li, P. Spanos, J. Chen and Y. Peng (Eds.), *Proc. 13th Int. Conf. Struct. Safety and Reliability (ICOSSAR 2021-2022), Tongji University, Shanghai (China), September 13-17*.

[22] Parisi, P., Moustapha, M., Marelli, S. and Sudret, B. (2022). A cost-aware and sensitivity-based active learning algorithm for system reliability. In *Proc. Engineering Mechanics Institute Conference (EMI'2022), Johns Hopkins University, Baltimore, MA (USA), May 31 - June 3*. (Talk given by M. Moustapha).

[23] Parisi, P., Moustapha, M., Marelli, S. and Sudret, B. (2022). Active learning for system reliability analysis using PC-Kriging, subset simulation and sensitivity analysis. In *Proc. 8th International Symposium on Reliability Engineering and Risk Management (ISRERM), Hannover (Germany), September 4-7*.

[24] Pires, A., Moustapha, M., Marelli, S. and Sudret, B. (2022). The effects of noise on reliability analysis. In *8th Eur. Congress Comput. Meth. Appl. Sci. Eng. (ECCOMAS 2022), Oslo (Norway), June 5-9*. (Talk given by A. Pires).

[25] Schär, S., Marelli, S. and Sudret, B. (2022). Autoregressive surrogate models of high-dimensional time-dependent wind turbine simulations for uncertainty quantification. In *Proc. Engineering Mechanics Institute Conference (EMI'2022), Johns Hopkins University, Baltimore, MA (USA), May 31 - June 3*.

[26] Wagner, P. R., Papaioannou, I., Marelli, S., Straub, D. and Sudret, B. (2022). Estimating failure probabilities using an adaptive variant of stochastic spectral embedding. In J. Li, P. Spanos, J. Chen and Y. Peng (Eds.), *Proc. 13th Int. Conf. Struct. Safety and Reliability (ICOSSAR 2021-2022), Tongji University, Shanghai (China), September 13-17*.

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[28] Zhu, X. and Sudret, B. (2022). Introducing latent variables in polynomial chaos expansions to surrogate stochastic simulators. In J. Li, P. Spanos, J. Chen and Y. Peng (Eds.), *Proc. 13th Int. Conf. Struct. Safety and Reliability (ICOSSAR 2021-2022), Tongji University, Shanghai (China), September 13-17*.

[29] Zhu, X., Broccardo, M. and Sudret, B. (2022). Use of generalized lambda models for seismic fragility analysis. In *Proc. 8th International Symposium on Reliability Engineering and Risk Management (ISRERM), Hannover (Germany), September 4-7*.

[30] Daub, M., Marelli, S. and Sudret, B. (2021). On constrained distribution-free p-boxes and their propagation. In A. Sofi, G. Muscolino and R. L. Muhanna (Eds.), *Proc. 9th Int. Workshop on Reliable Engineering Computing: "Risk and Uncertainty in Engineering Computations", Virtual Conference, May 17-20*.

[31] Ehre, M., Papaioannou, I., Sudret, B. and Straub, D. (2021). Estimating conditional failure probabilities with high-dimensional, computationally expensive models. In *Proc. 14th World Congress on Computational Mechanics (WCCM) and ECCOMAS Congress 2021, Paris, France, January 11-15*. (Talk given by M. Ehre).

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[33] Galimshina, A., Moustapha, M., Hollberg, A., Wagner, G., Padey, P., Lasvaux, S., Sudret, B. and Habert, G. (2021). Earth heating panels as a low-emitting, cost-effective and robust energy system for building renovation. In *Proc. 4th International Conference on Bio-Based Building Materials (ICBBM 2021), Barcelona (Spain), June 16-18*.

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[36] Lauvernet, C., Zhu, X., Helbert, C. and Sudret, B. (2021). Metamodeling methods that incorporate qualitative variables for improved design of vegetative filter strips. In *Proc. 4th Int. Conf. Uncertainty Quantification in Computational Sciences and Engineering (UNCECOMP), Athens (Greece), June 27-30*. (Talk given by C. Lauvernet).

[37] Lüthen, N., Marelli, S., Wiart, J. and Sudret, B. (2021). Surrogating stochastic simulators using sparse polynomial chaos expansions. In *Proc. 14th World Congress on Computational Mechanics (WCCM) and ECCOMAS Congress 2021, Paris, France, January 11-15*. (Talk given by N. Lüthen).

[38] Lüthen, N., Marelli, S. and Sudret, B. (2021). Surrogating stochastic simulators using spectral methods and advanced statistical modeling. In *MascotNum Workshop on Stochastic Simulators, March 11th*. (Talk given by N. Lüthen).

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[240] Sudret, B. and de Buhan, P. (1999). Reinforced geomaterials: computational model and applications. In R. Picu and E. Krempl (Eds.), *Proc. 4th Int. Conf. on Constitutive Laws for Engineering Materials (CLEM'99), Troy, USA*, pp. 339–342.

[241] Sudret, B. and de Buhan, P. (1998). Multiphase model of reinforced materials. In *Proc. 2nd Int. Ph.D Symposium in Civil Engineering, Budapest, Hungary*, pp. 516–523.

Invited Talks, Keynote and Plenary Lectures (from 2012)

[1] Sudret, B. (2024). Surrogate models for uncertainty quantification: Sparse polynomial chaos expansions and Kriging. In *Ph.D. course, RWTH Aachen, Institute for Advanced Studies in Computational engineering Sciences, January 16*. https://www.research-collection.ethz.ch/handle/20.500.11850/656832.

[2] Sudret, B. (2023). Reliability-based design optimization. In *Ph.D. course, RWTH Aachen, Institute for Advanced Studies in Computational engineering Sciences, January 24*.

[3] Sudret, B. (2023). Recent developments on surrogate models for stochastic simulators. In *U.S. Association for Computational Mechanics, Technical Thrust Area on Uncertainty Quantification and Probabilistic Modeling (Zoom), March 8*. https://vimeo.com/806123793/cbcd33010e. **Invited Lecture**.

[4] Sudret, B. (2023). Uncertainty quantification using surrogate modelling. In *9th International Conference on Modeling, Simulation and Applied Optimization (ICMSAO'23), Marrakech (Morocco), April 28*. http://hdl.handle.net/20.500.11850/654442. **Keynote lecture**.

[5] Sudret, B. (2023). Apports des métamodèles pour la simulation numérique. In *24th Seminar of the CEA-EDF-FRAMATOME Institute, CEA Saclay (France), Institut National des Sciences et Techniques Nucléaires (INSTN), June 2nd*. **Keynote lecture**.

[6] Sudret, B. (2023). Surrogate modelling for stochastic simulators. In *Proc. 5th Int. Conf. Uncertainty Quantification in Computational Sciences and Engineering (UNCECOMP'2023), Athens (Greece), June 12-14*. **Semi-plenary lecture**.

[7] Sudret, B. (2023). Active learning methods in structural reliability and design optimization. In A. O'Connor and V. Pakrashi (Eds.), *14th International Conference on Applications of Statistics and Probability in Civil Engineering (ICASP14), Dublin (Ireland), July 11*. **Keynote Lecture**.

[8] Sudret, B. (2023). An introduction to surrogate modelling for uncertainty quantification in computational sciences. In *International Conference on Data-Integrated Simulation Science (SimTech2023), Stuttgart (Germany), October 5*. **Invited lecture**.

[9] Sudret, B. (2022). Surrogate models and active learning for reliability analysis. In *Institut pour la Maitrise des Risques, Groupe "Sécurité et sûreté des structures", Paris (France), January 26*.

[10] Sudret, B. (2022). Uncertainty quantification, reliability and sensitivity analysis in geotechnical engineering – Framework and Monte Carlo simulation, and Bayesian calibration. In *Haute École d'Ingéniérie et d'Architecture, Fribourg (Switzerland), November 17*.

[11] Sudret, B. (2022). Surrogate models for uncertainty quantification in computational sciences. In *XLIII Ibero-Latin American Congress on Computational Methods in Engineering (CILAMCE 2022), Foz do Iguaçu (Brazil), November 22nd*. **Plenary Lecture**.

[12] Sudret, B. (2021). Surrogate models for forward and inverse uncertainty quantification. In *International Research Training Group "Modern Inverse Problems" - RWTH Aachen, January 11th*.

[13] Sudret, B. (2021). Polynomial chaos expansions. In *SPP 1886 Winter School – Polymorphic uncertainty modelling for the numerical design of structures, Dresden (Germany), March 10*.

[14] Sudret, B. (2021). Sparse polynomial chaos expansions. In *SPP 1886 Winter School – Polymorphic uncertainty modelling for the numerical design of structures, Dresden (Germany), March 10*.

[15] Sudret, B. (2021). Surrogate models for stochastic simulators: an overview and a focus on generalized lambda models. In *MascotNum Workshop on Stochastic Simulators, March 11th*.

[16] Sudret, B. (2021). Introducing surrogate models for stochastic simulators. In *Graduate Seminar of the Department of Civil and Systems Engineering, Johns Hopkins University, Baltimore (USA), April 15*.

[17] Sudret, B. (2021). Surrogate models for reliability analysis and reliability-based design optimization. In *18th International Probabilistic Workshop (IPW2020), University of Minho, Guimaraes, May 12-14*. **Keynote lecture**.

[18] Sudret, B. (2021). Surrogate models and active learning for reliability analysis. In *13th International Workshop on Rare-Event Simulation (RESIM 2021), Paris (France), May 18-21*.

[19] Sudret, B. (2021). Surrogate modelling approaches for stochastic simulators. In *Centrum Wiskunde & Informatica (CWI), Amsterdam (The Netherlands), June 17*.

[20] Sudret, B. (2021). Recent developments on surrogate models for stochastic simulators. In *4th Int. Conf. Uncertainty Quantification in Computational Sciences and Engineering (UNCECOMP), Athens (Greece), June 27-30*. **Plenary lecture**.

[21] Sudret, B. (2021). Polynomial chaos expansions in 90 minutes. In *4th National Conference on Multidisciplanary design, analysis and optimization (NCMDAO 2021), Madras (India), October 7*.

[22] Sudret, B. (2021). Benchmarking active learning methods for structural reliability analysis. In *8ème Journée de la conception robuste et fiable – Approches universitaires et industrielles, Clermont-Ferrand (France), October 21*.

[23] Sudret, B. (2021). Surrogate models for efficient uncertainty quantification. In *Euromech Colloquium 618 "Uncertainty Quantification in Computational Mechanics", Luxemburg, December 13-14*. **Keynote lecture**.

[24] Sudret, B. (2020). Surrogate modelling and uncertainty quantification in computational sciences. In *3rd Ph.D. Retreat of the Computational Science Zurich Graduate School, Luzern (Switzerland), August 27*.

[25] Sudret, B. (2020). Uncertainty quantification, reliability and sensitivity analysis in geotechnical engineering. In *Haute École d'Ingéniérie et d'Architecture, Fribourg (Switzerland), November 19*.

[26] Sudret, B. (2019). Sparse polynomial chaos expansions for uncertainty quantification and global sensitivity analysis. In *Ateliers de Modélisation de l'Atmosphère, Centre International de Conférences de Météo France, Toulouse (France), March 11th*.

[27] Sudret, B. (2019). Data-based sparse polynomial chaos expansions: applications in dynamics and machine learning. In *Uncertainty Quantification & Optimization Conference, Sorbonne University, Paris (France), March 19)*. **Keynote lecture**.

[28] Sudret, B. (2019). Surrogate models for uncertainty quantification and design optimization. In *Proc. 14ème Colloque National en Calcul des Structures, Giens (France), May 13th*. **Plenary lecture**.

[29] Sudret, B. (2019). Surrogate modelling meets machine learning. In *Proc. 3rd Int. Conf. Uncertainty Quantification in Computational Sciences and Engineering (UNCECOMP), Crete Island (Greece), June 25*. **Semi-plenary lecture**.

[30] Sudret, B. (2019). Polynomial chaos expansions. In *Summer School "Modeling and Numerical Methods for Uncertainty Quantification" (MNMUQ), Porquerolles Island (France), August 27-30*.

[31] Sudret, B. (2019). Sparse polynomial chaos expansions and more. In *Summer School "Modeling and Numerical Methods for Uncertainty Quantification" (MNMUQ), Porquerolles Island (France), August 27-30*.

[32] Sudret, B. (2018). Surrogate models for uncertain dynamical systems: applications to earthquake engineering. In *Symposium on Uncertainty Quantification in Computational Geosciences, BRGM (France), January 16*.

[33] Sudret, B. (2018). Active learning methods for reliability analysis of engineering systems. In *Workshop on Computational Challenges in the Reliability Assessment of Engineering Structures, TNO Delft (The Netherlands), January 24*.

[34] Sudret, B. (2018). Uncertainty quantification techniques for optimal engineering solutions. In *Bosch Campus (Renningen, Germany), February 6*.

[35] Sudret, B. (2018). Uncertainty quantification in the simulation of complex systems. In *First Int. Conf. on Infrastructure Resilience, ETH Zurich (Switzerland), February 15*.

[36] Sudret, B. (2018). Dimensionality reduction and surrogate modelling for high-dimensional UQ problems. In *Thematic Semester on Uncertainty quantification for complex systems: theory and methodologies, Workshop on "Reducing dimensions and cost for UQ in complex systems", Isaac Newton Institute for Mathematical Sciences, Cambridge (UK), March 6*.

[37] Sudret, B. (2018). Recent developments in surrogate modelling for uncertainty quantification. In *Vulnerability, Uncertainty, and Risk (Proc. 3rd Int. Conf. on Vulnerability, Risk Analysis and Management (ICVRAM2018), Florianopolis (Brazil), April 9*. **Keynote lecture**.

[38] Sudret, B. (2018). Surrogate modelling for uncertainty quantification in engineering applications. In *Seminar of Numerical Analysis, MATHICSE, Ecole Polytechnique Fédérale de Lausanne (Lausanne), May 22nd*.

[39] Sudret, B. (2018). Surrogate models for uncertainty quantification and reliability analysis. In *Office National d'Etudes et de Recherches Aérospatiales (Paris, France), June 12th*.

[40] Sudret, B. (2018). Non-intrusive sparse polynomial chaos expansions and global sensitivity analysis. In *Summer School "Uncertainty Quantification for PDEs: Numerical Analysis and Scientific Computing, High-dimensional Numerical Approximations", ETH Zurich, August 27-30*.

[41] Sudret, B. (2018). Rare events simulation (a.k.a reliability analysis). In *Summer School "Uncertainty Quantification for PDEs: Numerical Analysis and Scientific Computing, High-dimensional Numerical Approximations", ETH Zurich, August 27-30*.

[42] Sudret, B. (2016). Uncertainty quantification in engineering – Framework and applications. In *4th Risk Center Dialog Event, ETH Zurich (Switzerland), January 15*.

[43] Sudret, B. (2016). Uncertainty quantification in engineering – Framework and applications. In *Bundesamt für Energie, Bern (Switzerland), March 17*.

[44] Sudret, B. (2016). Surrogate models for uncertainty quantification and reliability analysis. In *Engineering Mechanics Institute Conference (EMI'2016), Vanderbilt University, Nashville (USA), May 23rd*. **Plenary lecture**.

[45] Sudret, B. (2016). Surrogate models for uncertainty quantification and sensitivity analysis. In *Séminaire de la Fédération Francilienne de Mécanique, Ecole Nationale Supérieure des Arts et Métiers, Paris (France), June 16*.

[46] Sudret, B. (2016). Uncertainty quantification in engineering sciences – Focus on surrogate models. In *Uncertainty Modeling for Electromagnetic Applications (UMEMA 2016), Paris (France), July 4*.

[47] Sudret, B. (2016). Uncertainty propagation using polynomial chaos expansions. In *Summer School "Uncertainty in Modelling", Bauhaus Universität Weimar (Germany), September 5-8*.

[48] Sudret, B. (2016). UQLab: the uncertainty quantification software framework. In *Summer School "Uncertainty in Modelling", Bauhaus Universität Weimar (Germany), September 5-8*.

[49] Sudret, B. (2016). Uncertainty quantification for engineering risk analysis. In *GAMM-UQ Uncertainty Quantification Summer School, Weierstrass Institute for Applied Analysis and Stochastics, Berlin (Germany), September 12-16*.

[50] Sudret, B. (2016). Structural reliability methods. In *GAMM-UQ Uncertainty Quantification Summer School, Weierstrass Institute for Applied Analysis and Stochastics, Berlin (Germany), September 12-16*.

[51] Sudret, B. (2016). Surrogate models for uncertain dynamical systems: polynomial chaos expansion for time-dependent responses. In *4ème Forum sur les Méthodes de Quantification des Incertitudes, CEA DAM, Bruyères-le-Châtel (France), October 4*.

[52] Sudret, B. (2016). Surrogate models for global sensitivity analysis – Old and new. In *8th Int. Conf. Sensitivity Analysis of Model Output (SAMO'2016), La Réunion Island, December 1st*. **Keynote lecture**.

[53] Sudret, B. and Marelli, S. (2015). Polynomial chaos expansions for structural reliability. In *2èmes Journées de la conception robuste et fiable, Association Française de Mécanique, Paris (France), April 10th*.

[54] Sudret, B., Marelli, S. and Lataniotis, C. (2015). Sparse polynomial chaos expansions as a machine learning regression technique. In *International Symposium on Big Data and Predictive Computational Modeling, Munich (Germany), May 18-21*.

[55] Sudret, B. (2015). Sparse polynomial chaos expansions for solving high-dimensional UQ problems. In *1st Int. Conf. Uncertainty Quantification in Computational Sciences and Engineering (UNCECOMP), Creta Island (Greece), May 26*. **Semi-plenary lecture**.

[56] Sudret, B. (2015). A few things I learned from Prof. Armen Der Kiureghian. In *Risk and Reliability Symposium in Honor of Prof. Armen Der Kiureghian, University of Illinois at Urbana-Champaign (USA), October 4*.

[57] Sudret, B. (2015). Sparse polynomial chaos expansions for uncertainty propagation and sensitivity analysis. In *Workshop on "Propagation of Uncertainty", Institut Louis Bachelier, Paris (France), December 11th*.

[58] Sudret, B. (2014). Uncertainty quantification in engineering – a computational viewpoint. In *Proc. 11th German Probability and Statistics Days (GPSD 2014)*.

[59] Sudret, B. (2014). Uncertainty quantification in engineering. In *Risk Center Seminar, ETH Zurich (Switzerland), March 25*.

[60] Sudret, B. (2014). Polynomial chaos expansions for sensitivity analysis. In *École Chercheurs "Analyse de sensibilité, propagation d'incertitudes et exploration numérique de modèles en sciences de l'environnement", Les Houches (France), May 9*.

[61] Sudret, B. (2014). Polynomial chaos expansions – Theory, Numerical Methods & Applications (part i). In *Summer School "Modeling and Numerical Methods for Uncertainty Quantification" (MNMUQ), Porquerolles Island (France), September 1-4*.

[62] Sudret, B. (2014). Polynomial chaos expansions – Theory, Numerical Methods & Applications (part ii). In *Summer School "Modeling and Numerical Methods for Uncertainty Quantification" (MNMUQ), Porquerolles Island (France), September 1-4*.

[63] Sudret, B. (2014). Polynomial chaos-based surrogate models for sensitivity analysis. In *Centre d'hydrogéologie et géothermie (CHYN), Université de Neuchâtel (Switzerland), November 10th*.

[64] Sudret, B. (2013). Computational methods for uncertainty quantification and sensitivity analysis of complex systems. In *LabeX MS2T, Université Technologique de Compiègne (France), February 14*.

[65] Sudret, B. (2013). Sparse polynomial chaos expansions in engineering applications. In *Workshop on "Numerical Methods for Uncertainty Quantification", University of Bonn (Germany), May 14*.

[66] Sudret, B. (2013). Uncertainty quantification in engineering. In *ETH Zurich (Switzerland), April 9*. **Inaugural lecture**.

[67] Sudret, B. (2013). A short review of computational methods for uncertainty quantification in engineering. In *DBAUG Workshop on common challenges in computationally-based engineering research, ETH Zurich (Switzerland), June 5*. (Talk only).

[68] Sudret, B. (2013). Fiabilité des structures et analyse de risque. In *Journée FSA - Droit de la Construction, Fribourg (Switzerland), September 13*.

[69] Sudret, B. (2013). Basics of structural reliability and links with structural design codes. In *Fachgruppe für Brückenbau und Hochbau – Herbsttagung "Schäden, Unfälle - Entstehung", ETH Zurich (Switzerland), November 22nd*.

[70] Sudret, B. (2013). Sparse polynomial chaos expansions and application to sensitivity analysis. In *Int. Workshop Uncertainty Quantification in fluids Simulation, INRIA Bordeaux (France), December 18*.

[71] Sudret, B. (2012). Statistical approaches and uncertainty propagation in electromagnetism. In *Journée AREMIF "Simulation électromagnétique et complexité – avancées et défis", Paris (France),March 21st*.

[72] Sudret, B. (2012). Variance-based sensitivity indices for models with correlated inputs using polynomial chaos expansions. In *First SIAM Conf. on Uncertainty Quantification, Raleigh (NC), April 1st*.

[73] Sudret, B. (2012). Meta-models for structural reliability and uncertainty quantification. In K. Phoon, M. Beer, S. Quek and S. Pang (Eds.), *Proc. 5th Asian-Pacific Symp. Struct. Reliab. (APSSRA'2012), Singapore*, pp. 53–76. **Keynote lecture**.

[74] Sudret, B. (2012). Sensitivity analysis in case of dependent input variables using polynomial chaos expansions. In *MascotNum Workshop , University of Toulouse (France), May 3rd*.

[75] Sudret, B. (2012). Rare events simulation: classical engineering methods and current trends using meta-models. In *9èmes Journées de Statistique de Rennes (JSTAR'2012), October 26*.

National Conferences and Workshops

[1] Moustapha, M. and Sudret, B. (2019). Quantification d'incertitudes en simulation, métamodèles et optimisation fiable. In *Journée NAFEMS sur la conception robuste et fiable, Paris (France), June 6*.

[2] Broccardo, M., Marelli, S., Sudret, B. and Stojadinovic, B. (2017). Uncertainties in seismic hazard and risk analysis: the good, the bad and the way ahead of the current state-of-the-art. In *DBAUG Workshop on Natural Hazards, ETH Zurich (Switzerland), June 8th*. (Talk given by M. Broccardo).

[3] Torre, E., Marelli, S., Embrechts, P. and Sudret, B. (2017). Vine copula modeling of high-dimensional inputs in uncertainty quantification problems. In *1st Italian Meeting on Probability and Mathematical Statistics, Torino (Italy), June 19-22 (Poster)*.

[4] Moustapha, M., Sudret, B., Bourinet, J.-M. and Guillaume, B. (2016). Quantile-based optimization using adaptive Kriging models: Application to car body design. In *3èmes Journées de la conception robuste et fiable, Association Française de Mécanique, Paris (France), May 10th*. (Talk given by M. Moustapha).

[5] Moustapha, M., Sudret, B., Bourinet, J.-M. and Guillaume, B. (2016). Quantile-based optimization using adaptive Kriging models: Application to car body design. In *MascotNum Workshop on "Dealing with stochastics in optimization problems", Paris (France), May 13th, 2016*. (Talk given by M. Moustapha).

[6] Schöbi, R., Marelli, S. and Sudret, B. (2016). Méthodes numériques pour la fiabilité des systèmes complexes : la plate-forme UQLab. In *Proc. 9e Journées Fiabilité des Matériaux et des Structures, Nancy, France*.

[7] Torre, E., Marelli, S., Embrechts, P. and Sudret, B. (2016). Modeling high-dimensional system inputs with copulas for uncertainty quantification problems. In *Welcome Home Workshop 2016, University of Torino (Italy), December 22nd*. (Talk given by E. Torre).

[8] Sudret, B. and Marelli, S. (2014). UQLab: Une plate-forme pour la quantification des incertitudes sous Matlab. In *Proc. 8e Journées Fiabilité des Matériaux et des Structures, Aix-en-Provence, France*.

[9] Sudret, B. (2013). A short review of computational methods for uncertainty quantification in engineering. In *DBAUG Workshop on common challenges in computationally-based engineering research, ETH Zurich (Switzerland), June 5th*. (Talk only).

[10] Marelli, S. and Sudret, B. (2013). UQLab: a framework for uncertainty quantification in MATLAB. In *Swiss Numerics Colloquium 2013, Lausanne (Switzerland), April 5th*. (Talk given by S. Marelli).

[11] Sudret, B. and Mai, C.-V. (2013). Calcul des courbes de fragilité sismique par approches non-paramf́riques. In *Proc. 21e Congrès Franï¿½ais de Mécanique (CFM21), Bordeaux*.

[12] Caniou, Y., Sudret, B. and Micol, A. (2012). Analyse de sensibilité globale pour des variables corrélées – application aux modèles imbriqués et multiéchelles. In *Proc. 18e Congrès de Maï¿½trise des Risques et Sûreté de Fonctionnement, Tours, France*.

[13] Dubourg, V., Bourinet, J.-M., Sudret, B., Cazuguel, M. and Yalamas, T. (2012). Optimisation du dimensionnement au flambement d'une coque résistante de sous-marin sous contrainte de fiabilité. In *Proc. 18e Congrès de Maï¿½trise des Risques et Sûreté de Fonctionnement, Tours, France*.

[14] Caniou, Y., Sudret, B. and Micol, A. (2012). Analyse de sensibilité globale pour des variables corrélées – application aux modèles imbriqués et multiéchelles. In *Proc. 7e Journées Fiabilité des Matériaux et des Structures, Chambéry, France*.

[15] Dubourg, V., Defaux, G., Willaume, P. and Meister, B., E.and Sudret (2012). échantillonnage préférentiel quasi-optimal par krigeage pour l'évaluation de la fiabilité des cuves de réacteurs à eau pressurisée. In *Proc. 7e Journées Fiabilité des Matériaux et des Structures, Chambéry, France*.

[16] Dubourg, V., Sudret, B. and Cazuguel, M. (2011). Modélisation probabiliste de champs d'imperfections géométriques de coques résistantes de sous-marins. In *Proc. 10e Colloque National en Calcul des Structures, Giens*.

[17] Dubourg, V., Sudret, B., Bourinet, J.-M. and Cazuguel, M. (2011). Optimisation sous contrainte de fiabilité d'une structure en treillis. In *Proc. 10e Colloque National en Calcul des Structures, Giens*.

[18] Caniou, Y., Defaux, G., Dubourg, V., Sudret, B. and Petitet, G. (2011). Caractérisation indirecte de défauts géométriques de forme liés au process de fabrication d'un élément d'essuie-glace. In *Proc. 20e Congrès Franï¿½ais de Mécanique (CFM20), Besançon*.

[19] Caniou, Y. and Sudret, B. (2011). Analyse de sensibilité globale pour des modèles à paramètres dépendants. In *Proc. 20e Congrès Franï¿½ais de Mécanique (CFM20), Besançon*.

[20] Yalamas, T., Moine, S., Lussou, P. and Sudret, B. (2010). Evaluation fiabiliste et approche réglementaire. In *Proc. 6e Journées Fiabilité des Matériaux et des Structures, Toulouse*.

[21] Blatman, G. and Sudret, B. (2010). Chaos polynomial creux et adaptatif basé sur la procédure Least Angle Regression – application à l'analyse d'intégrité d'une cuve de réacteur de centrale nucléaire. In *Proc. 6e Journées Fiabilité des Matériaux et des Structures, Toulouse*.

[22] Blatman, G. and Sudret, B. (2009). Chaos polynomial creux basé sur la technique de *least angle regression*. In *Proc. 19e Congrès Franï¿½ais de Mécanique (CFM19), Marseille*.

[23] Blatman, G. and Sudret, B. (2009). Eléments finis stochastiques non intrusifs à partir de développements par chaos polynomiaux creux et adaptatifs. In *Proc. 9e Colloque National en Calcul des Structures, Giens*.

[24] Dubourg, V., Bourinet, J.-M. and Sudret, B. (2009). Analyse fiabiliste du flambage des coques avec prise en compte du caractère aléatoire et de la variabilité spatiale des défauts de forme et d'épaisseur, et des propriétés matériaux. In *Proc. 19e Congrès Français de Mécanique (CFM19), Marseille*.

[25] Blatman, G. and Sudret, B. (2009). Efficient global sensitivity analysis of computer simulation models using an adaptive *least angle regression* scheme. In *41e Journées Françaises de Statistique, Bordeaux*.

[26] Yalamas, T., Pendola, M. and Sudret, B. (2009). Traitement des incertitudes avec le logiciel PhimecaSoft. In *Proc. 9e Colloque National en Calcul des Structures, Giens*.

[27] Perrin, F., Pendola, M. and Sudret, B. (2008). Experimental data integration for the lifetime assessment of structures submitted to thermal fatigue loadings. In *Proc. 16ème Congrès de Maï¿½trise des Risques et de Sûreté de Fonctionnement (LambdaMu 16)*.

[28] Blatman, G. and Sudret, B. (2008). Développements par chaos polynomiaux creux et adaptatifs – application à l'analyse de fiabilité. In *Proc. 5e Journées Fiabilité des Matériaux et des Structures, Nantes*.

[29] Berveiller, M., Le Pape, Y., Sudret, B. and Perrin, F. (2008). Méthode MCMC pour l'actualisation bayésienne des déformations différées du béton d'une enceinte de confinement modélisée par éléments finis stochastiques non intrusifs. In *Proc. 5e Journées Fiabilité des Matériaux et des Structures, Nantes*.

[30] Perrin, F., Sudret, B., Blatman, G. and Pendola, M. (2007). Use of polynomial chaos expansion and maximum likelihood estimation for probabilistic inverse problems. In *Proc. 18e Congrès Français de Mécanique, (CFM'2007), Grenoble*.

[31] Perrin, F., Sudret, B. and Pendola, M. (2007). Bayesian updating of mechanical models – Application in fracture mechanics. In *Proc. 18e Congrès Français de Mécanique (CFM'2007), Grenoble*.

[32] Blatman, G., Sudret, B. and Berveiller, M. (2007). Quasi random numbers in stochastic finite element analysis – Application to reliability analysis. In *Proc. 18e Congrès Français de Mécanique, (CFM'2007), Grenoble*.

[33] Perrin, F. and Sudret, B. (2007). Actualisation de modèles paramétriques – Application sur un modèle de propagation de fissure. In *Colloque MECAMAT, Aussois*, pp. 361–364.

[34] Gaignaire, R., Moreau, O., Sudret, B. and Clénet, S. (2006). Propagation d'incertitudes en électromagnétisme statique par chaos polynomial et résolution non intrusive. In *Proc. 5e Conf. Eur. sur les Méthodes Numériques en Electromagnétisme (NUMELEC'2006), Lille*.

[35] Berveiller, M., Sudret, B. and Lemaire, M. (2005). Construction de la réponse paramétrique déterministe d'un système mécanique par éléments finis stochastiques. In *Proc. 7e Colloque National en Calcul des Structures, Giens*.

[36] Berveiller, M., Sudret, B. and Lemaire, M. (2005). Eléments finis stochastiques non linéaires en mécanique de la rupture. In *Proc. 17e Congrès Français de Mécanique (CFM17), Troyes*. Paper #159.

[37] Sudret, B. (2005). Des éléments finis stochastiques spectraux aux surfaces de réponses stochastiques : une approche unifiée. In *Proc. 17e Congrès Français de Mécanique (CFM17), Troyes*. Paper #864.

[38] Sudret, B. (2004). Cadre d'analyse probabiliste global des tuyauteries en fatigue thermique. In *Proc. 23e Journées de Printemps – Commission Fatigue, "Méthodes fiabilistes en fatigue pour conception et essais", Paris*.

[39] Guédé, Z., Sudret, B. and Lemaire, M. (2004). Analyse fiabiliste en fatigue thermique. In *Proc. 23e Journées de Printemps – Commission Fatigue, "Méthodes fiabilistes en fatigue pour conception et essais", Paris*.

[40] Raphael, W., Seif El Dine, B., Mohamed, A., Sudret, B. and Calgaro, J.-A. (2004). Correction bayésienne et étude fiabiliste des modèles de calcul du fluage du béton. In *Proc. $\lambda\mu$14, Bourges*.

[41] Sudret, B., Berveiller, M. and Lemaire, M. (2003). Eléments finis stochastiques spectraux : nouvelles perspectives. In *Proc. 16e Congrès Français de Mécanique (CFM16), Nice*.

[42] Andrieu, C., Lemaire, M. and Sudret, B. (2003). La méthode PHI2 ou comment prendre en compte la dépendance du temps dans une analyse en fiabilité mécanique. In *Proc. 6e Colloque National en Calcul des Structures, Giens*.

[43] Dridi, W., Sudret, B. and Lassabatère, T. (2002). Experimental and numerical analysis of transport in a containment vessel. In *Proc. 2nd Biot Conference, Grenoble, France*.

[44] Sudret, B. (2001). Eléments finis stochastiques spectraux et fiabilité. In *Proc. 15e Congrès Français de Mécanique (CFM15), Nancy*.

[45] de Buhan, P. and Sudret, B. (1999). Micropolar continuum description of materials reinforced by linear inclusions. In *Proc. Conf. to the memory of Pr. J.-P. Boehler, "Mechanics of heterogeneous materials", Grenoble*.

[46] de Buhan, P. and Sudret, B. (1999). Un modèle biphasique de matériau renforcé par inclusions linéaires. In *Proc. 14e Congrès Français de Mécanique (CFM14), Toulouse*.