

Curriculum Vitae

Havenith, Hans-Balder

Born: August 7, 1974, Eupen, Belgium.
Living in: Hauset, Belgium
Father of three children



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Diplomas

Graduate Degree in Geology (Diploma), University of Liege (ULg), 1996.
Degree of Civil Engineer in Geology, University de Liege, 1998.
Degree of Doctor of Applied Sciences, University de Liege, 2003.

Positions

PhD supported by the EU-Copernicus project ‘Landslide risk triggered by earthquakes in Kyrgyzstan’: 1998-1999.
PhD supported by the *Fonds National de la Recherche Scientifique*: 1999-2003.
Scientific Collaborator (post-doc) of the *Fonds National de la Recherche Scientifique*: 2003-2004.
Chargé de Cours adjoint (associate lecturer) at the University of Liege: 2003-2007.
Postdoc Researcher and associate lecturer at the ETH Zurich, 2004-2007.
Chargé de Cours (lecturer – tenure track position) at the University of Liege, since 2007.

Awards

Le prix des Jeunes, 1996: National (Belgian) Award for the best diploma thesis in Geology in 1996: ‘*Etude structurale du Massif Anorthositique d'Egersund-Ogna en Norvège méridionale*’. (*Structural analysis of the anorthosite massif of Egersund-Ogna in Southern Norway*).

Médaille Clément Guion, 1999: University of Liege Award for the best diploma thesis in Engineering Geology in 1998: ‘*Etude de la Structure et de la Réponse Dynamique du Graben de Volvi (Grèce) à partir de Données Géophysiques et Sismologiques*’. (*Study of the structure and the dynamic response of the Volvi Graben (Greece) using geophysical and seismological data*).

Young Scientist's Travel Award for Europeans for participation in the EGS conference, 2002, Nice.

Best Paper Award 2016 for: H.B. Havenith, A. Torgoev, A. Braun, R. Schlögel, M. Micu (2016). A new classification of earthquake-induced landslide event sizes based on seismotectonic, topographic, climatic and geologic factors. *Geoenvironmental Disasters*, 3(6), 2-24.

Languages

German: mother tongue; French, English: written and verbal fluency;
Russian, Italian and Dutch: basic knowledge.

Research Fields and Interests

Geological risk assessment: seismic hazard computation and seismic microzonation; mapping of landslide susceptibility; studies of compound (coupled) geohazards; size-frequency analyses related to natural hazards assessment.

Engineering and environmental geology: investigations of landslides, dam construction sites, tailings and areas with deep geothermal energy potential; prevention of environmental disasters (risk scenarios with geological and anthropogenic influence).

Applied geophysics: seismic methods (seismic refraction, surface wave inversion, seismic tomography), electrical sounding and tomography of landslides and karstic areas.

Seismological experiments for site effects analyses: single station and array investigation methods, earthquake recordings.

Structural geology and neotectonics with focus on deep fault structure investigation.

Geodetic measurements (DGPS) applied to landslide deformation.

Dynamic Numerical Modelling of seismic wave propagation and slope stability.

Geological Modelling and 3D Visualisation of seismo-tectonic and gravitational surface effects.

Mapping and Spatial Analysis with Geographic Information Systems, optical remote sensing.

Field Experience over the past 12 years

Rhone Valley (Switzerland): geophysical-seismological surveys in the: > 2 weeks in 2006.

Kyrgyzstan: geophysical-seismological surveys on landslides in the frame of the NIDECO (ETH Zurich) project: August 2005.

Kyrgyzstan: geological survey on landslides in the frame of FP6 INCO project: September 2008.

Kyrgyzstan: seismic microzonation of the city of Osh in the frame of a project organized by the ACTED and Aga Khan NGOs project: July 2009.

Democratic Republic of Congo: microseismic tests and soil sampling for the characterization of waste disposal sites in Lubumbashi, Belgian collaboration project: August 2009.

Kyrgyzstan: seismological survey on landslides, NATO SFP LADATSHA project: Sept. 2009.

Kyrgyzstan: seismic monitoring of the 2500-ton blast completed for the construction of the Kambarata 2 blast-fill dam, NATO SFP LADATSHA project: December 2009.

Tajikistan: Microseismic survey on loess landslides: September 2010.

Kyrgyzstan: Seismological, DGPS and Geoelectric survey on landslides in the Kyrgyz Tien Shan (NATO SFP project): July-August 2011.

China: Microseismic survey in the Gaxu Nur Basin: August-September 2011.

Kyrgyzstan: Geoelectric survey on the Kambarata dam construction site: July 2012.

Central Africa: Geophysical survey on landslides near Bujumburai: July 2013 and August 2014.

Haiti: Site effects study near Port-au-Prince: April 2014.

Romania: study of earthquake-triggered landslides in the Vrancea Region: July 2014, Sept. 2015.

East Belgium: Electrical Tomography, Seismic Refraction and TDEM surveys in the Hockai Fault Zone for the GEOPHYGEO THERM project (Walloon Region funding), within several Master theses (Liege University and RWTH Aachen University), the present FRIA PhD thesis: > 30 field days between 2014 and 2017.

Tajikistan: seismic and microseismic sounding on a mass movement crossed by the future right-bank spillway of the Rogun Dam, Tajikistan: August 2015.

Haiti: Site effects study near Port-au-Prince: January 2017.

Romania: Various geophysical (ERT, seismic, seismological) measurements on two rockslide sites: two field surveys in 2016 and 2017.

Kyrgyzstan: *MSF* project: seismic safety assessment for medical and educational centres in the mining areas in S-Kyrgyzstan: July 2018.

Major project activities over the past 12 years

Scientific coordinator of the NIDECO (ETH Zurich fund) project ‘Landslide Risk along the Border of the Fergana Basin (Kyrgyzstan, Central Asia). Back-analysis of recent disasters with focus on earthquake-trigger mechanisms’: 2005-2006.

Postdoc researcher at ETH Zurich in the INTERREG III ‘Microzonation of southern Upper Rhine region’, the EU-project ‘SISMOVALP Seismic hazard and alpine valley response analysis’ and NERIES EC-project ‘Network of Research Infrastructures for European Seismology’: 2005-2007.

Collaborator and Task Leader in the INCO EC-Project ‘NATASHA International Working Group on Natural Hazards in the Tien Shan’: 2006-2008.

Coordinator of a project of bilateral collaboration between Belgium and the Democratic Republic of Congo (partner *Université de Lubumbashi*): *Prospection et caractérisation de sites de décharges publiques pour la Ville de Lubumbashi* (‘Investigation and characterisation of waste disposal sites near Lubumbashi’): 2009-2010.

Coordinator of the Scientific Research (FNRS) Grant 2010 for acquisition of seismic stations and field surveys in the epicentral region of the 1949 Khait earthquake, Tajikistan: 2009-2011.

Participant in the project: ‘Development of a ‘geothermal’ platform for Wallonia’: 2010-2011.

Coordinator of the NATO Science for Peace project: ‘LADATSHA Prevention of Landslide Dam disasters in the Tien SHAn, Kyrgyz Republic’: 2008-2012.

Coordinator of 3 bilateral collaboration grants (landslide risk assessment) between Belgium and Algeria, Belgium and Romania (partner *Université de Constantine*, Algeria; Romanian Academy - Institute of Geography, Romania): 2008-2014.

Coordinator of the industrial project (Walloon Region funding) ‘GEOPHY-GEOTHERM *Reconnaissance géophysique du potentiel géothermique de la Zone de Faille de Hockai (dans la région de Malmédy*. (‘Geophysical reconnaissance of the geothermal potential of the Hockai Fault Zone in the region of Malmédy’): 2014-2015.

Since 2014, project and teaching activities of the Georisks and Environment group have been supported by a permanent computer scientist specialised in GIS and 3D modelling - visualisation.

Participation in the Belspo (Belgian Federal) project GeoRisCA ‘Geo-risk in Central Africa: integrating multi-hazards and vulnerability to support risk management’. Leader of the Landslide Risk Assessment Task: 2012-2016.

Participation in the bilateral collaboration project *Renforcement des moyens géotechniques et géophysiques de l’Université d’Etat d’Haïti pour contribuer à l’amélioration de l’urbanisation au pays* (‘Strengthening of the geotechnical and geophysical infrastructure of the University of Haiti to improve urbanisation of the country’): 2012-2016.

Coordinator of two Belgian-Romanian collaboration grants ‘Assessment of earthquake-triggered landslide risk over long terms in the Vrancea region, Romania’: 2015-2016, 2016-2017.

Coordinator of the BE-CH (FNRS-SNF) joint research project on ‘4D seismic response and slope failure’, with applications in Belgium, Switzerland and Romania: 2018-2021.

Coordinator of a new Earthquake risk assessment project in Haiti: 2019-2023.

Contractual Studies

Participation as expert in a scientific committee of pilot projects related to deep geothermal energy exploitation in Wallonia: 2012- 2016.

Seismic hazard assessment for nuclear power facilities in Belgium.

Investigation of the right-bank spillway zone near the Rogun dam construction site: 2015-2016; new proposal for numerical modelling study of seismic slope stability submitted.

MSF project (subcontractor for ICES) on the seismic safety assessment for medical and educational centers in S-Kyrgyzstan.

Prospection and database management for a potential Einstein Telescope site in the BE-NE-DE border region: 2018.

Memberships

European Geosciences Union: member

International Association for Engineering Geology and the Environment: member

iRALL - International Research Association on Large Landslides: scientific committee member.

ICGdR - International Consortium on Geo-disaster Reduction: member.

Publications

Papers in International Journals and book chapters (Scopus): 56

Contributions in International Conferences and Workshops: 90

including about 12 invited communications and publication of 26 short conference papers

h-factor Scopus: 16

h-factor Google Scholar: 21

Reviewer for Near Surface Geophysics; Natural Hazards; Natural Hazards and Earth system Sciences; Journal of Seismology; Bulletin of the Seismological Society of America; EOS; Engineering Geology; Environmental Geology; Terrestrial, Atmospheric and Oceanic Sciences; Landslides; Hydrological Processes; Earth Surface Processes and Landforms, International Journal of Digital Earth.

Editor for Landslides, Geoenvironmental Disasters, Revista de Geomorfologie (Romania)

Selected publications (hazard and risk studies)

H.B. Havenith, D. Jongmans, K. Abdrakhmatov, P. Trefois, D. Delvaux and I.A. Torgoev (2000). Geophysical investigation of seismically induced surface effects: case study of a landslide in the Suusamyry valley, Kyrgyzstan. *Surveys in Geophysics*, 21, 349-369.

H.-B. Havenith, D. Jongmans, E. Faccioli, K. Abdrakhmatov and P.-Y. Bard (2002). Site effects analysis around the seismically induced Ananevo rockslide, Kyrgyzstan. *Bulletin of the Seismological Society of America*, 92, 3190-3209.

H.-B. Havenith, A. Strom, D. Jongmans, K. Abdrakhmatov, D. Delvaux and P. Tréfois (2003). Seismic triggering of landslides, Part A: Field evidence from the Northern Tien Shan. *Natural Hazards and Earth System Sciences*, 3, 135-149.

H.-B. Havenith, A. Strom, F. Calvetti and D. Jongmans (2003). Seismic triggering of landslides, Part B: Simulation of dynamic failure processes. *Natural Hazards and Earth System Sciences*, 3, 663-682.

K. Abdrakhmatov, H.-B. Havenith, D. Delvaux, D. Jongmans and P. Trefois (2003). Probabilistic PGA and Arias Intensity maps of Kyrgyzstan (Central Asia). *Journal of Seismology*, 7, 203-220.

H.-B. Havenith, M. Vanini, D. Jongmans and E. Faccioli (2003). Initiation of earthquake-induced slope failures: influence of topographical and other site specific amplification effects. *Journal of Seismology*, 7, 397-412.

C. Bourdeau, H.B. Havenith, J-A. Fleurisson and G. Grandjean (2004). Numerical modelling of seismic slope stability. In *Engineering Geology for Infrastructure Planning in Europe*, Lecture Notes in Earth Sciences, Hack, Azzam, Charlier (eds) , 104, 671-684.

H.B. Havenith, A. Strom, F. Caceres and E. Pirard (2006). Analysis of landslide susceptibility in the Suusamyry region, Tien Shan: statistical and geotechnical approach. *Landslides*, 3, 39-50.

H.B. Havenith, I. Torgoev, A. Meleshko, Y. Alioshin, A. Torgoev and G. Danneels (2006).

- Landslides in the Mailuu-Suu valley, Kyrgyzstan : Hazards and Impacts. *Landslides*, 3, 137-147.
- H.B. Havenith, D. Fäh, U. Polom and A. Roullé (2007). S-wave velocity measurements applied to the seismic microzonation of Basel, Upper Rhine Graben. *Geophys. J. Int.*, 170, 346-358.
- G. Danneels, E. Pirard, and H.B. Havenith (2007). Automatic landslide detection from remote sensing images using supervised classification methods. *Geoscience and Remote Sensing Symposium. IGARSS 2007. IEEE*, 3014-3017.
- M.-J. García Rodríguez, H.B. Havenith, B. Benito Oterino (2008). Evaluation of earthquake-triggered landslides in El Salvador using a Gis based newmark model. *In Proc. of the 14th World Conference on Earthquake Engineering*, 12-17/10/2008, Pekin (China).
- D. Fäh , G. Stamm and H.B. Havenith (2008). Analysis of three-component ambient vibration array measurements. *Geophys. J. Int.*, 172, 199-213.
- C. Bourdeau and H.B. Havenith (2008). Site effects modelling applied to the slope affected by the Suusamyr earthquake (Kyrgyzstan, 1992). *Engineering Geology*, 97, 126-145.
- G. Danneels, C. Bourdeau, I. Torgoev and H.B. Havenith (2008). Geophysical investigation and numerical modelling of unstable slopes: case-study of Kainama (Kyrgyzstan). *Geophys. J. Int.*, 175, 17-34.
- H.B. Havenith, D. Fäh, S. Alvarez-Rubio and D. Roten (2009). Response spectra for the deep sediment-filled Rhône Valley in the Swiss Alps. *Soil Dyn. and Earthquake Engineering*, 29, 17-38.
- H.B. Havenith and C. Bourdeau (2010). Earthquake-induced hazards in mountain regions: a review of case histories from Central Asia - an inaugural lecture to the society. *Geol. Belgica*, 13/3, 135-150.
- R. Schlögel, I. Torgoev, C. De Marneffe and H.B. Havenith (2011). Evidence of a changing distribution of landslides in the Kyrgyz Tien Shan, Central Asia. *Earth Surface Processes and Landforms*, 36(12), 1658-1669.
- H.B. Havenith, K. Abdrakhmatov, I. Torgoev, A. Ischuk, A. Strom, E Bystrický, A Cipciar (2013). Earthquakes, landslides, dams and reservoirs in the Tien Shan, Central Asia. 2nd World Landslide Forum, WLF 2011, Rome, Italy; published in 'Landslide Science and Practice: Risk Assessment, Management and Mitigation' (Springer, eds. Margottini et al.), 6, Pages 27-31.
- H.B. Havenith, I. Torgoev, A. Torgoev, A. Strom, Y. Xu, T. Fernandez-Steegeer (2015). The Kambarata 2 blast-fill dam, Kyrgyz Republic, blast event, geophysical monitoring and dam structure modeling. *Geoenvironmental Disasters*, 2:1, 1-15. 10.1186/s40677-015-0021-x
- H.B. Havenith, A. Torgoev, A. Braun, R. Schlögel, M. Micu (2016). A new classification of earthquake-induced landslide event sizes based on seismotectonic, topographic, climatic and geologic factors. *Geoenvironmental Disasters*, 3(6), 2-24.
- A. Torgoev, H.B. Havenith (2016). 2D dynamic studies combined with the surface curvature analysis to predict Arias Intensity amplification. *Journal of Seismology*, 3, 711-731.
- H.-B. Havenith, P. Cerfontaine, A.-S. Mreyen (2017). How virtual reality can help visualise and assess geohazards. *International Journal of Digital Earth*, 1-17.
- H.B. Havenith, A.S. Mreyen, A. Torgoev, M. Mihai (2017). Numerical models of unstable slopes in seismic areas – based on 3D geomodels. 4th World Landslide Forum, WLF 2017, Ljubljana, Slovenia, in 'Advancing Culture of Living with Landslides', 47-57.
- A.S. Mreyen, M. Mihai, Alexandru Onaca, P. Cerfontaine, H.B. Havenith (2017). Integrated Geological-Geophysical Models of Unstable Slopes in Seismic Areas. 4th World Landslide Forum, WLF 2017, Ljubljana, Slovenia, in 'Advancing Culture of Living with Landslides', 269-279.
- S. Ulysse, D. Boisson, C. Prépetit, H.B. Havenith (2018). Site Effect Assessment of the Gros-Morne Hill Area in Port-au-Prince, Haiti, Part A: Geophysical-Seismological Survey Results. *Geosciences*, 8, 142, 1-22.

Teaching activities

Lectures, Seminars and Field Work in ‘Applied Geophysics’ (30h/y) at ULg: 2002-2003.
Field Work Seminars in ‘Applied Geophysics – Seismic Noise’ (30h/y) at ETH Zurich: 2004-2007.
Lectures in ‘Engineering Seismology, Probabilistic Seismic Hazard Assessment’ (15h/y), ETH Zurich: 2006-2007.
Lectures in ‘Geological Risk assessment’ (30h - 80h/y) at ULg: since 2003.
Lectures in ‘Geological Mapping I+II’ (>100h/y) at ULg: since 2007.
Lectures in ‘Neotectonics, Seismology and Physical Volcanology’ (50h/y) at ULg, now combined with English II lecture, as given in English: since 2012.
Lectures in ‘Structural Geomorphology’ (30h/y) at ULg: since 2014.
Lectures in ‘Modelling and Informatics’ (30h/y) at ULg: starting in October 2017.
Lectures in ‘Geothermy’ (15 out of 60h/y) at ULg: starting in October 2017.
7 international field visits organised in the Alps and Sicily between 2009 and 2017.

Director of 1 completed and 4 ongoing PhD theses and committee member of two ongoing PhD studies, supervisor of 2 postdoc researches

Dr. Almaz Torgoev: ‘Assessment of landslide hazard in the environmental hot spot areas of the Kyrgyz Tien Shan: Spatial analysis and Numerical modelling’. Defended in April 2017.
Mr. Leonidas Nibigira: Hydrological risk related to landslide activity near Bujumbura, Burundi. Start in 2012. Defence planned in spring 2018.
Mrs. Sophia Ulysse (joint PhD Liege University – Haiti State University): Development of seismic microzonation methodologies with application in Haiti and tests in Eastern Belgium. Start in 2013. Defence planned in spring 2018.
Mreyen, A.S. (FRIA PhD: 2016-2020): Developing integrated structural-geophysical geomechanical models of landslides in seismic regions. Started in October 2016.
Hakimov, F. (Student stipend): Seismic microzonation of Dushanbe, Tajikistan. Started in 2017.
Fan, X. (Axa postdoc: Dec. 2016 – Nov. 2018). Risk Assessment of Earthquake-induced cascading geological hazard.
Luo, Y. (Chinese fellowship for 1-year postdoc in Belgium: Sept. 2017- Aug. 2018). Numerical Modelling of topographic site effects and comparison with experimental data.

PhD Jury member

2009: PhD thesis evaluation (Risk assessment), University of Liege, Belgium
2010: PhD thesis evaluation (engineering seismology), Université Joseph Fourier, Grenoble, France
2011: PhD thesis evaluation (remote sensing), University of Liege, Belgium
2012: PhD thesis evaluation (slope stability analysis), TU Braunschweig, Germany
2012: PhD thesis evaluation (applied geophysics), University of Liege, Belgium
2013: PhD thesis evaluation (hazard scenarios), University of Twente - ITC, Netherlands
2014: PhD thesis evaluation (remote sensing), University of Potsdam, Germany
2016: PhD thesis evaluation (Neotectonics), RWTH Aachen University, Germany
2017: PhD thesis evaluation (passive seismics), Sapienza Università di Roma, Italy
2018: PhD thesis – jury president, Liege University, Belgium.
2018: PhD thesis – jury member, Wageningen University, Netherlands.

Director (or co-director) of 25 (successfully completed) Diploma/Master theses in Geology, Engineering Geology and Natural Risk Management (complementary Master), at Liege University and RWTH Aachen University, since 2005.

Below, the titles of 10 selected Master theses are presented:

Schlögel, R. (2009): Detection of recent landslides in Maily-Say Valley, Kyrgyz Tien Shan, based on field observations and remote sensing data. Master Thesis in Geology, University of Liege, 133 p. (director).

De Marneffe (2010): *Cartographie et modélisation 3D de la géologie de la vallée de Mailuu-Suu, Tien Shan. Mémoire* (Master Thesis in Geology: ‘Geological Mapping and 3D Modelling applied to the Mailuu-Suu Valley, Tien Shan’), University of Liege, 93 p. (director).

Dumont, G. (2010): The use of the H/V spectral ratio technique in urban areas: the seismic microzonation of the City of Osh, Kyrgyz Republic and a preliminary evaluation of the site effects in Aachen, Germany. Master Thesis in Engineering Geology, University of Liege, 90 p. (director)

Braun, A. (2010): Investigation of the landslide susceptibility in Maily-Say, Kyrgyzstan, with data mining methods. Master Thesis in Georesources Management, RWTH Aachen University, 93 p. (co-director)

Dupont, B. (2011): Application of microseismic measurements and geomodelling to the study of two loess landslides in the valley of Faizabad, Northern Tajikistan. Master Thesis in Geology, University of Liege, 65 p. (director)

Deprez, R. (2012): Prospection géophysique et géomodélisation 3D du glissement de terrain et du bassin de retenue de Tuyuk-Suu, Minkush, Tien Shan kirghize. Mémoire (Master Thesis in Geology: ‘Geophysical investigation and 3D geomodelling of landslide and tailing sites in Minkush, Kyrgyz Tien Shan’), University of Liege, 98 p. (director)

Xu, Y. (2014): *Geologische 3D Modellierung und Analyse der Standsicherheit des Kambarata-2 Sprengschuttdammes. Masterarbeit* (Master Thesis in Applied Geosciences: ‘3D geological modelling and slope stability analysis applied to the Kambarata-2 blast-fill dam’), RWTH Aachen University, 100 p. (co-director)

Heeren, M. (2014): *Caractérisation de la zone faille de Hockai et évaluation de son potentiel géothermique. Mémoire* (Master Thesis in Geology: ‘Characterisation of the Hockai Fault Zone and evaluation of its geothermal potential’), University of Liege, 103 p. (director)

Mreyen, A.S. (2016). Geophysical investigations and numerical back analysis of a landslide in the Poudingue de Malmedy, located in the Hockai Fault Zone, Belgium. Master Thesis presented at the RWTH Aachen University, 134 p. (co-director).

Matossian, A. (2017). Identification of giant mass movements in the Lesser Caucasus and assessment of their spatial relationship with major fault zones and volcanoes. Master Thesis presented at Liege University, 137 p. (director).