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**Hongjing REN**

# Quantifying the Contribution of Strong-Wind Events to the Migration of Barchan Dunes

**When?** | **Monday, May 12, 2025, at 07:30 AM (Brussels time)**

**Where?** | **Join the online session via: <https://tinyurl.com/5ayt364h>**

## Summary

Wind is a primary erosional force in shaping aeolian landforms. Although strong wind events are infrequent and short-lived, they play a critical role in the formation and evolution of desert landscapes. However, the relative contribution of these strong-wind events to aeolian sediment transport and dune dynamics, compared to more regular winds, remains poorly understood. A fundamental question arises: how do different wind speed levels contribute to the deformation of aeolian landforms and the intensity of wind-blown sand hazards? Barchan dunes, the most common type of crescent-shaped dune, typically form under unidirectional wind regimes. Their deformation and migration are controlled by both the strength and duration of erosive winds. This study aims to quantify the contributions of different wind speed levels to barchan dune migration. Using *in situ* measurements of high-frequency wind data and high-resolution topographic surveys, we analyzed short-term strong wind events of varying intensities and monitored the rapid migration of barchan dunes. This approach allowed us to report, for the first time, the relative contribution of short-term strong winds to barchan dune migration.

## Supervisors

Prof. Dr. Ir. Alain De Wulf (Ghent University)  
Prof. Dr. Philippe De Maeyer (Ghent University)  
Prof. Dr. Jiaqiang Lei (University of Chinese Academy of Sciences)

## About the Author

Hongjing REN (born in 1992) is a joint PhD candidate at the Department of Geography, Ghent University, and the University of Chinese Academy of Sciences. She obtained her bachelor's degree in Geography from Shanxi Normal University in 2015 and earned her master's degree in Soil and Water Conservation and Desertification Control from the Xinjiang Institute of Ecology and Geography, Chinese Academy of Sciences (XIEG, CAS) in 2019. In 2020, she began her doctoral studies in Physical Geography at XIEG, CAS, while simultaneously pursuing a joint PhD at Ghent University. Her research focuses on aeolian geomorphology and desertification control.

## Examination Committee

Prof. Dr. Nico Van de Weghe (Ghent University, Chair)  
Prof. Dr. Shengyu Li (University of Chinese Academy of Sciences, Co-Chair)  
Prof. Dr. Ir. Pieter Rauwoens (KU Leuven)  
Prof. Dr. Ir. Wim Cornelis (Ghent University)  
Prof. Dr. Tim Van de Voorde (Ghent University)  
Prof. Dr. Bailiang Li (Xi'an Jiaotong-Liverpool University)  
Prof. Dr. Yang Zhang (Xi'an Jiaotong University)  
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