

Beyond rigidity - Collapsing structures in experimental hydraulics

Initiative: "Experiment!" (beendet)

Ausschreibung: Explorative Phase

Bewilligung: 01.11.2017

Laufzeit: 1 Jahre 6 Monate

Tsunamis and tropical cyclones cause wide-spread destruction and claim many lives when making landfall. Warning and evacuation measures heavily rely on accurately forecasting site-specific hazard implications. Existing forecast tools represent structures in the pathway of hazardous flows as rigid, stationary obstacles. However, this choice affects the momentum balance of the flow and causes the forecasted results to remain inaccurate where structures are dislodged. The rigid building paradigm in tsunami and hurricane engineering has not been contested before. One reason is the presumed inability to simultaneously down-scale the relevant hydraulic flow and structural-mechanical properties. To this end the project aims at combining experiments in a wave channel with modeling of flow-structure interaction, including progressive building collapse and debris fate. The results could dramatically increase the accuracy of models predicting tsunami action. Pushing this limit bears great potential to save lives and protect economic value when natural hazards occur.

Projektbeteiligte

Prof. Dr.-Ing. Nils Goseberg

Technische Universität Braunschweig
Architecture, Civil Engineering and Env. Science
Leichtweiß-Institut für Wasserbau
Abteilung für Hydromechanik und Küsteningenieur-
wesen
Braunschweig