

NUMERIC MODELLING OF THRUST SHEET GEOMETRIES ON AN EXAMPLE OF THE NORTHERN CALCAREOUS ALPS (NCA)

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INTRODUCTION

- Geologic structures are often triggers of natural hazards (landslides, rock falls, earthquakes...).
- Understanding geologic structures is a prerequisite to predict and manage natural hazard risk.
- This study deals with structures (thrust sheet geometries) which are important for the earthquake hazard management

STRUCTURES AND EARTHQUAKES AN EXAMPLE: CHI CHI EARTHQUAKE TAIWAN 1999



Fig. 1: 921 Earthquake museum Taiwan
(source: google street view)

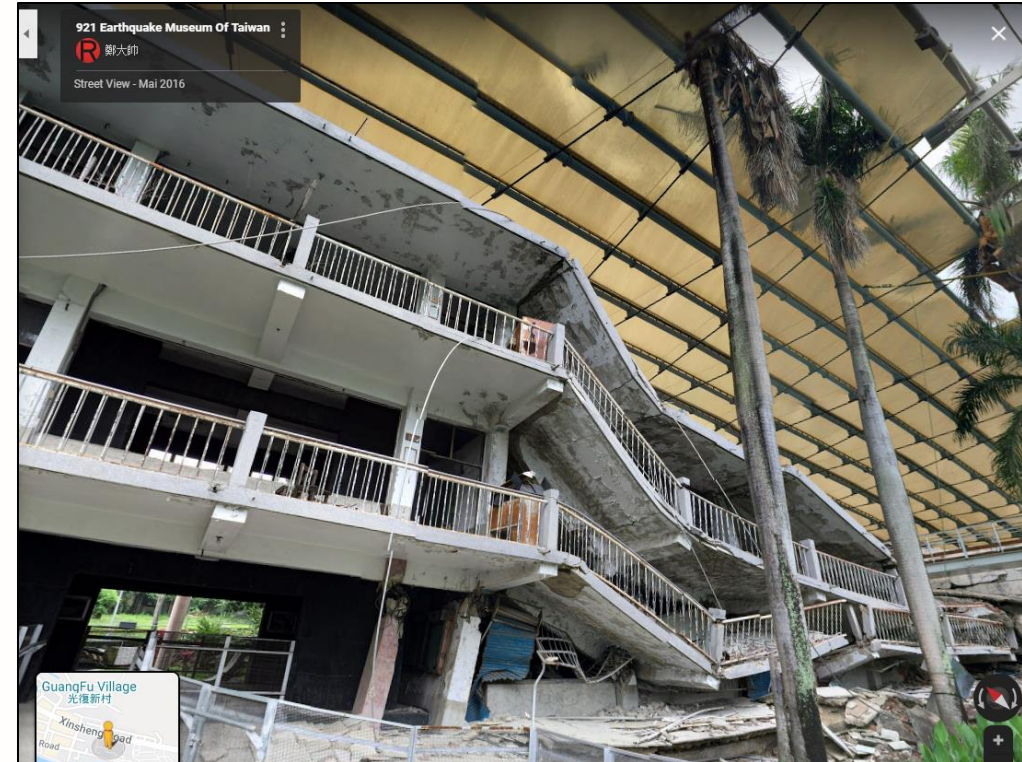


Fig. 2: 921 Earthquake museum Taiwan
(source: google street view)

STUDY AREA/AIM

Study area:

- Northern Calcareous Alps fold and thrust belt
 - Inactive fold and thrust belt
 - Accessible structures
 - Exposed structures

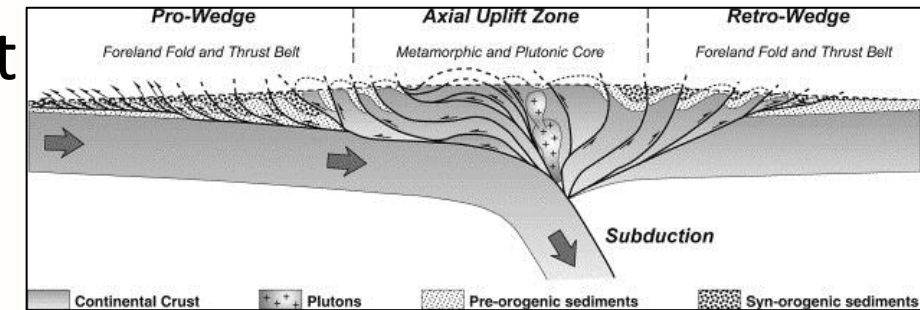


Fig. 3: McClay, 2004

Aim of the study:

- Better understanding of the development of structures
- Improved geologic profiles which are the basis for risk management

STUDY DESIGN

- Set up a numeric model for the NCA
 - Simplified model of the NCA sedimentary succession (3 layers)
 - The material models are linear elasticity and Mohr Coulomb
 - Testing several boundary conditions and settings (rheology differences, erosion and sedimentation, layer thickness)

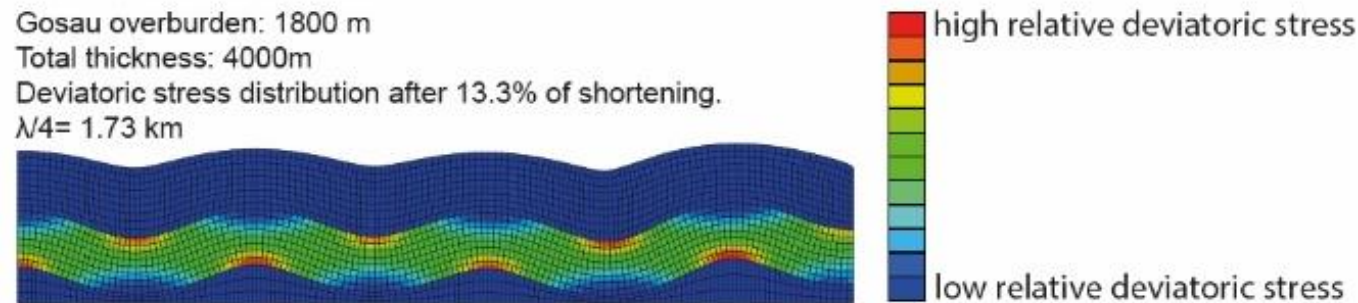


Fig. 4: Results of deviatoric stress distribution for the linear elasticity model.

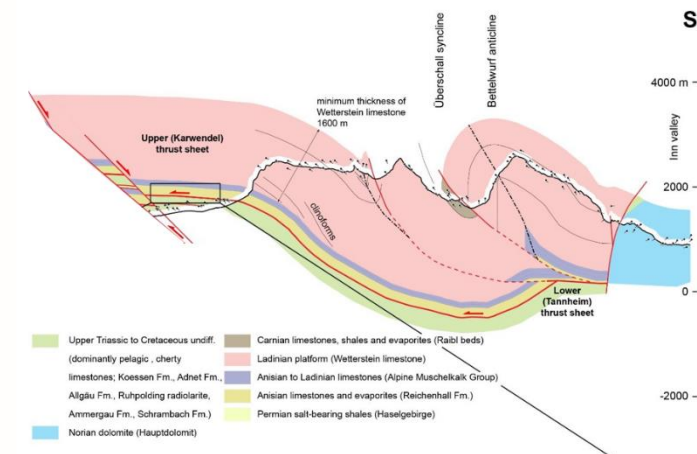


Fig. 5: Large scale folds in the Karwendel mountains.

- Deduce theoretical (geometric-rheologic model to construct cross sections) and practical contributions (natural hazard management because the intensity of earthquakes is depending on the depth of the hypocentre).

THANK YOU FOR YOUR ATTENTION