Experimental structures

What is structurally non conventional?

Marine Bagnéris



1 Introduction

2 Definitions

3 Current & traditional structural theory

4 Non conventional approaches

5 Example of non conventional tools

6 Conclusion



- Permanent loading (total dead load)
- variable loading (snow, etc)

Gravitational forces

- Wind pressure
- ▶ Inertia forces (earthquakes, dynamic accelerations,...)

Introduction



Internal forces

-----Behaviour?



- Structural theory based on models
- Hypotheses must be done
 - ...and define boundaries of the behaviour model
 - need to discuss the meaning of current vocabulary







Deformation

Strain

Définitions





STRAIN



STRAIN







Zaha Hadid – Strasbourg - France

- Rigidity
 - Material stiffness
 - ---- Young Modulus E





Anish Kapoor – Tate Gallery - UK



- Key boundaries and general assumptions
 - ----- hard materials
 - elastic strength
 - ----- small deflections
 - ----- small deformations
 - ---- static
 - planarity, orthogonality



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- Key boundaries and general assumptions
 - hard materials
 - elastic strength
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- Potential boundaries
 - soft materials
 - —— "new" materials
 - large deflections
 - large deformations
 - dynamic, shape actualisation



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Example of non conventional tools



- Share a same vocabulary to communicate between design partners
- A better understanding of the current assumptions aims at pushing over some boundaries
- Be careful with tools...
 - ----- Think first