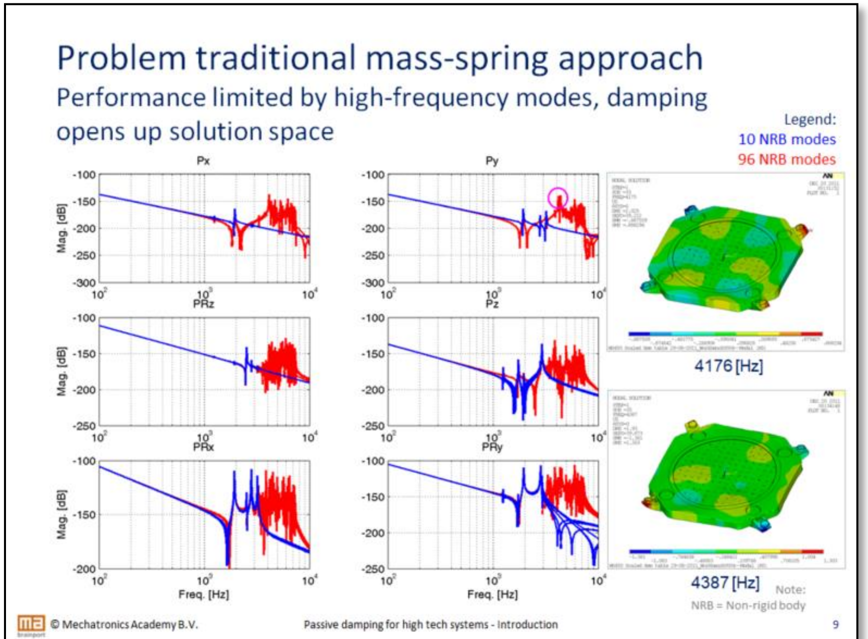
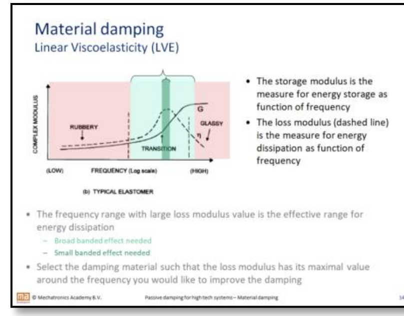
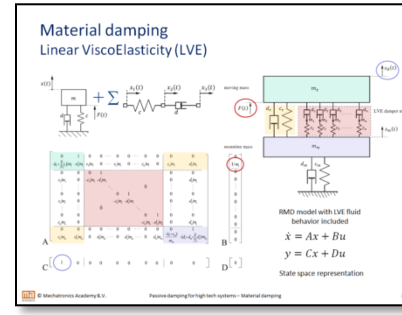
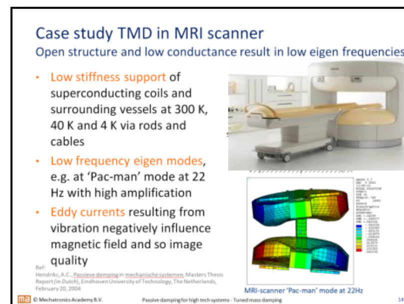
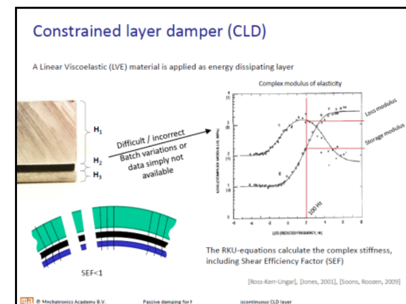
Passive Damping for High Tech Systems

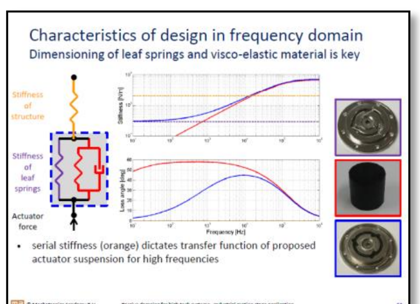


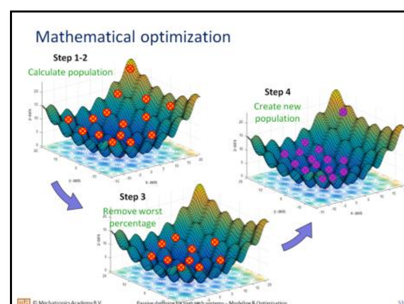












Contents

- Mechatronics Training Curriculum
- Details of Course *Passive Damping for High Tech Systems*

Mechatronics Training Curriculum

Premium

- Workshop Mechatronics System Design — **On request**

Premium / Advanced

- Advanced Motion Control — **5 days**
- Advanced Feedforward & Learning Control — **3 days**
- Passive Damping for High Tech Systems — **3 days**
- Masterclass Design Principles — **On request**

Advanced

- Advanced Mechatronic System Design — **6 days**

Standard

- Motion Control Tuning — **5 days**
- Dynamics and Modelling — **3 days**
- Design Principles for Precision Eng. — **5 days**
- Basics and Design for Ultra Clean Vacuum — **4 days**
- Experimental Techniques in Mechatronics — **3 days**
- Metrology & Calibration of Mechatronic Systems — **3 days**
- Actuation and Power Electronics — **3 days**
- Machine Vision for Mechatronic Systems — **2 days**
- Thermal Effects in Mechatronic Systems — **3 days**

Basic

- Mechatronics System Design – part 2 — **5 days**
- Mechatronics System Design – part 1 — **5 days**

Start

Relevant partner trainings:
Applied Optics, Electronics for non-electrical engineers, System Architecture, Soft skills for technology professionals, …

www.mechatronics-academy.nl

Mechatronics Academy

- In the past, many trainings were developed within Philips to train own staff, but the training center CTT stopped.
- **Mechatronics Academy B.V.** has been setup to provide continuity of the existing trainings and develop new trainings in the field of precision mechatronics. It is founded and run by:
    - Prof. Maarten Steinbuch
    - Prof. Jan van Eijk
    - Dr. Adrian Rankers
- We cooperate in the **High Tech Institute** consortium that provides sales, marketing and back office functions.

Passive Damping for High Tech Systems

Course Director(s) / Trainers

Teachers

- Prof.Dr.ir. Hans Vermeulen (Eindhoven University of Technology & ASML)
- Dr.ir. Kees Verbaan (NTS Group)

Industrial Guest Speaker

- Dr.ir. Stan van der Meulen (ASML)

Course Director(s)

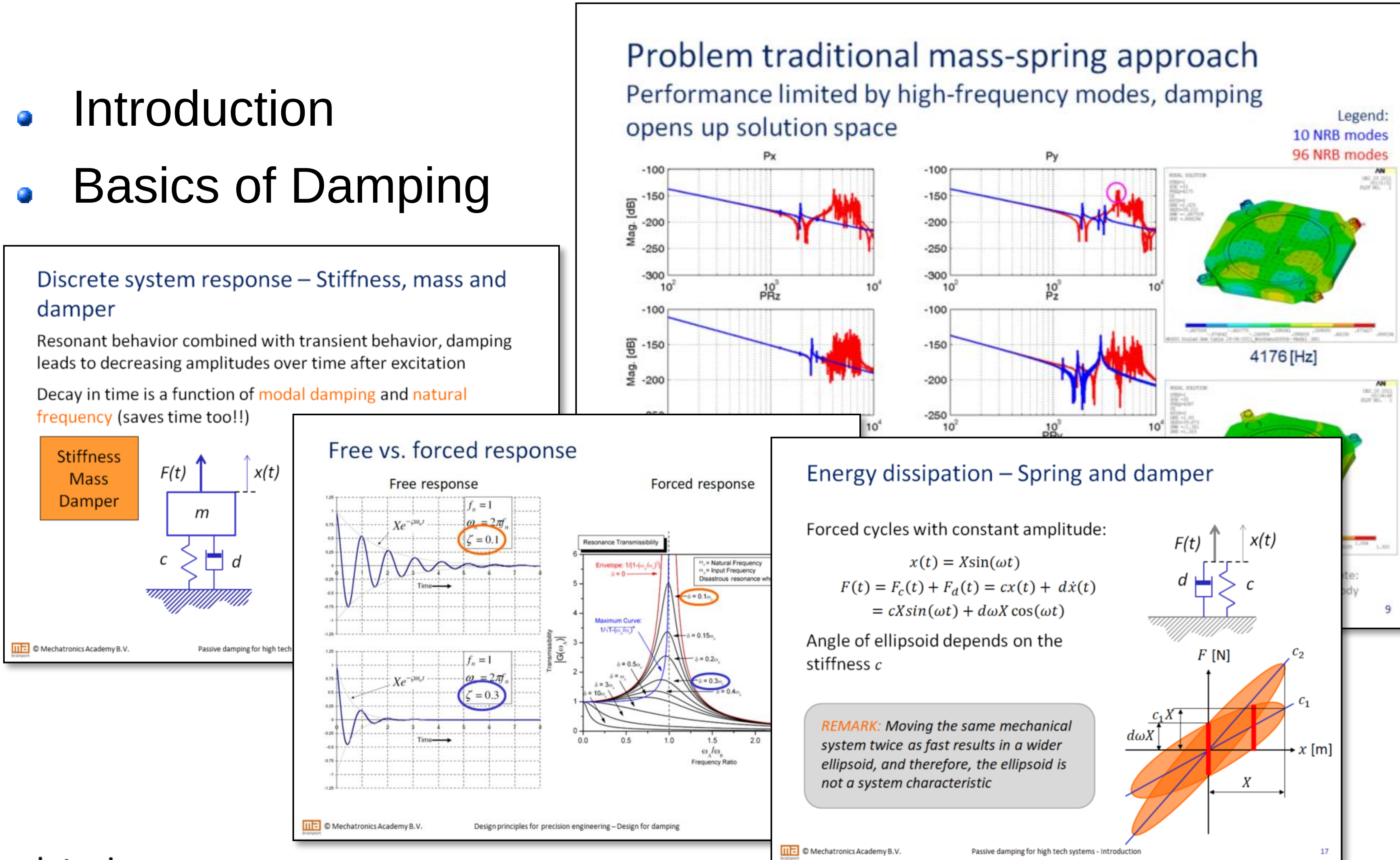
- Prof.Dr.ir. Hans Vermeulen (Eindhoven University of Technology & ASML)
- Dr.ir. A.M. Rankers (Mechatronics Academy)

Program

Day	Contents
1	• Introduction
	• Basics of Damping (energy dissipation, modal damping, exponential decay, other application domains)
	Lunch
	• Materials & Damping
	• Tuned Mass Dampers (Basics, Design Considerations, Case Study TMD in MRI Scanners)
2	• Case TMD Design for Ceramic Tool Slides
	• Constrained Layer Damping (Modelling, Case Flexures & Frames)
	Lunch
	• Demo & Exercise CLD
	• CLD for Discontinuous Surfaces
3	• Robust Mass Damping (design, testing & semiconductor wafer stage case)
	• Integral Modelling & Optimization (approach, algorithms, over-actuated wafer chuck case)
	Lunch
	• Industrial Case Semiconductor Industry (modelling approach, design & analysis)
	• Special Topics

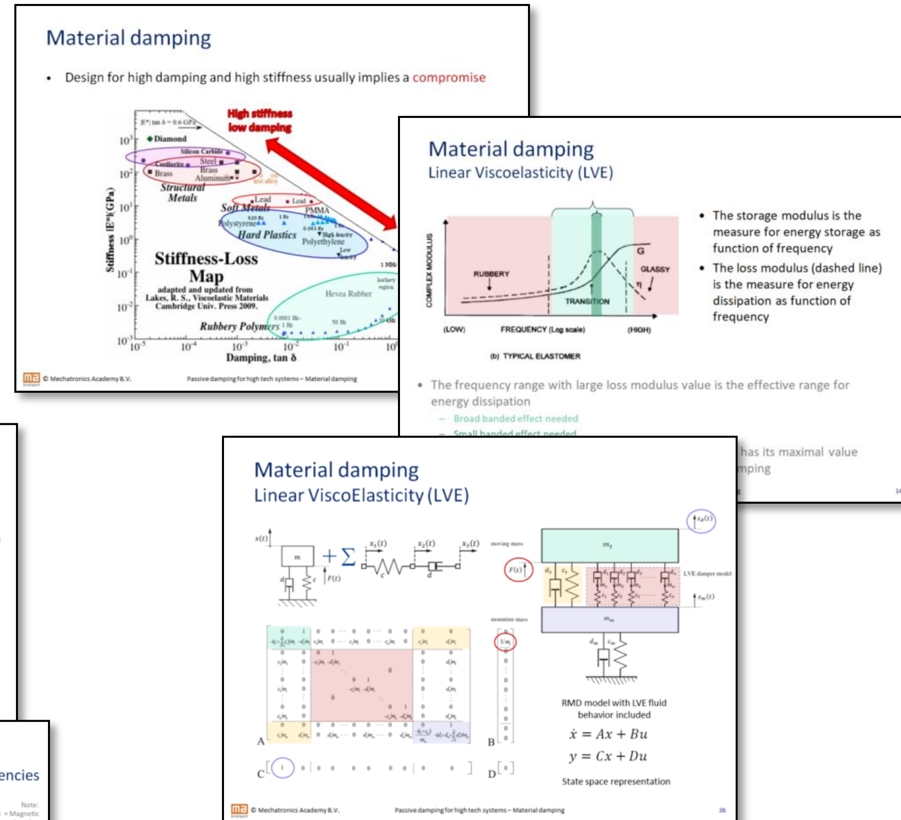
Day 1 (morning): Intro & Basics

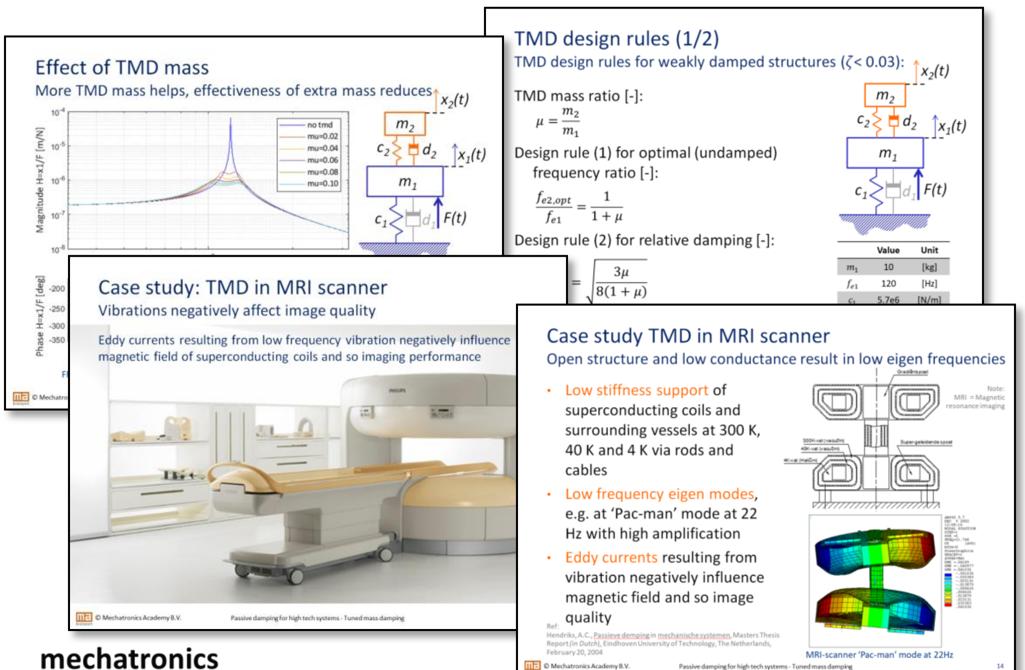
- Introduction
- Basics of Damping



Day 1 (afternoon): Materials & TMD

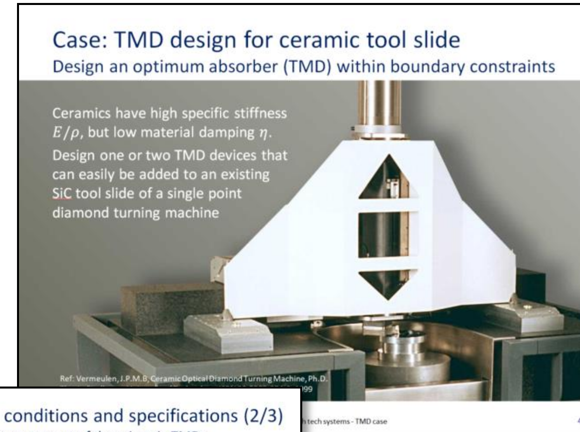
- Materials & Damping
- Tuned Mass Damping (TMD)
  - Basics
  - Design Considerations
  - Case Study MRI Scanner

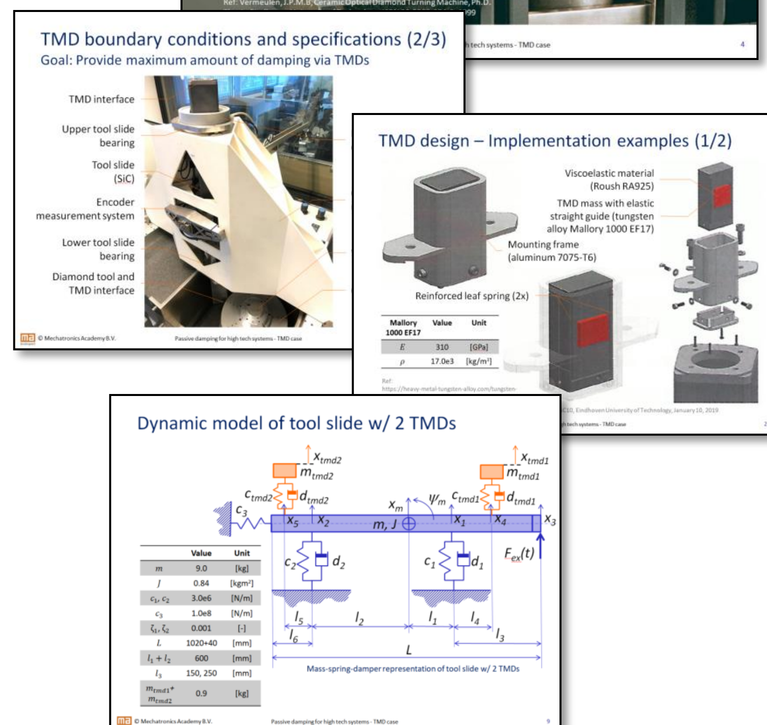


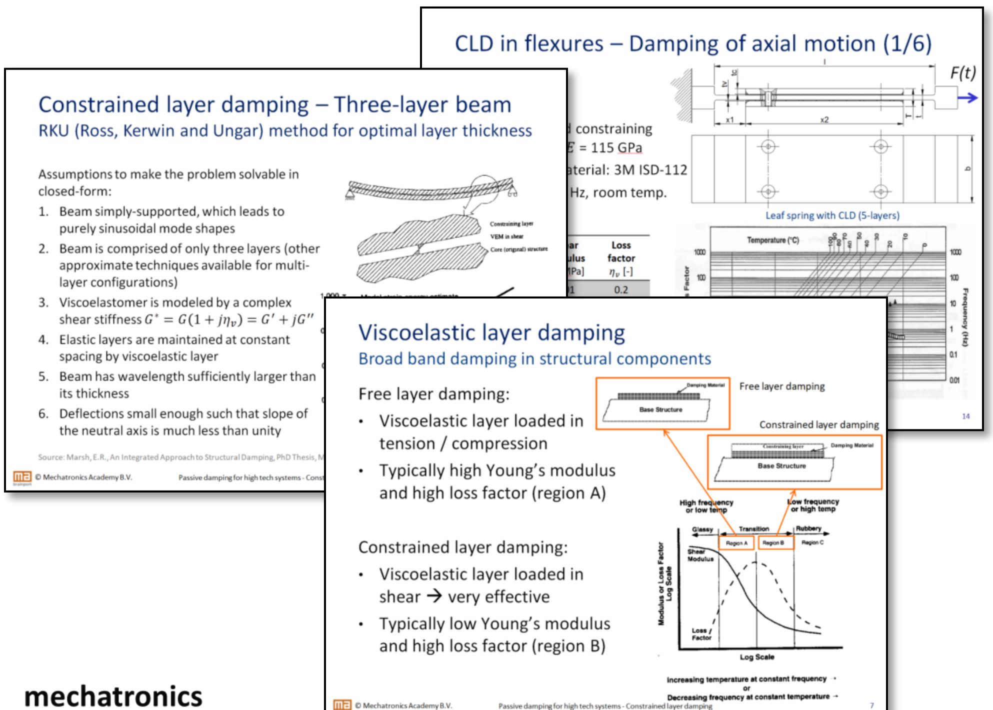


Day 2 (morning): TMD case & CLD

- TMD Case
- Constrained Layer Damping (CLD)
  - Modelling
  - Case Flexures & Frames

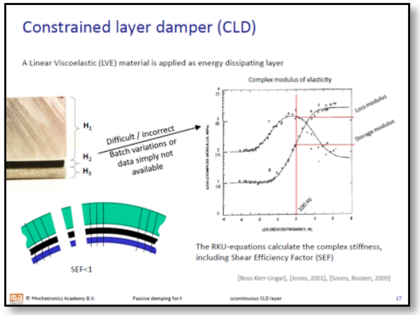






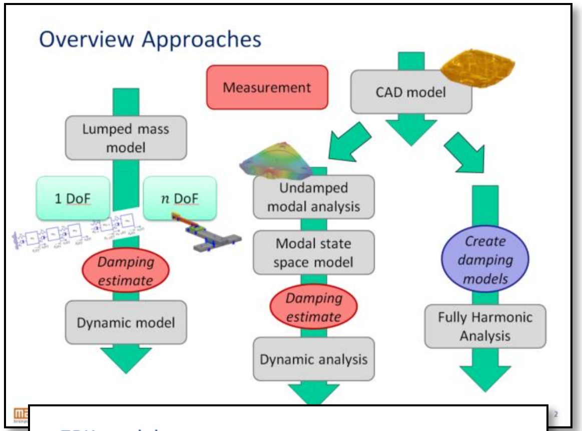
Day 2 (afternoon): CLD

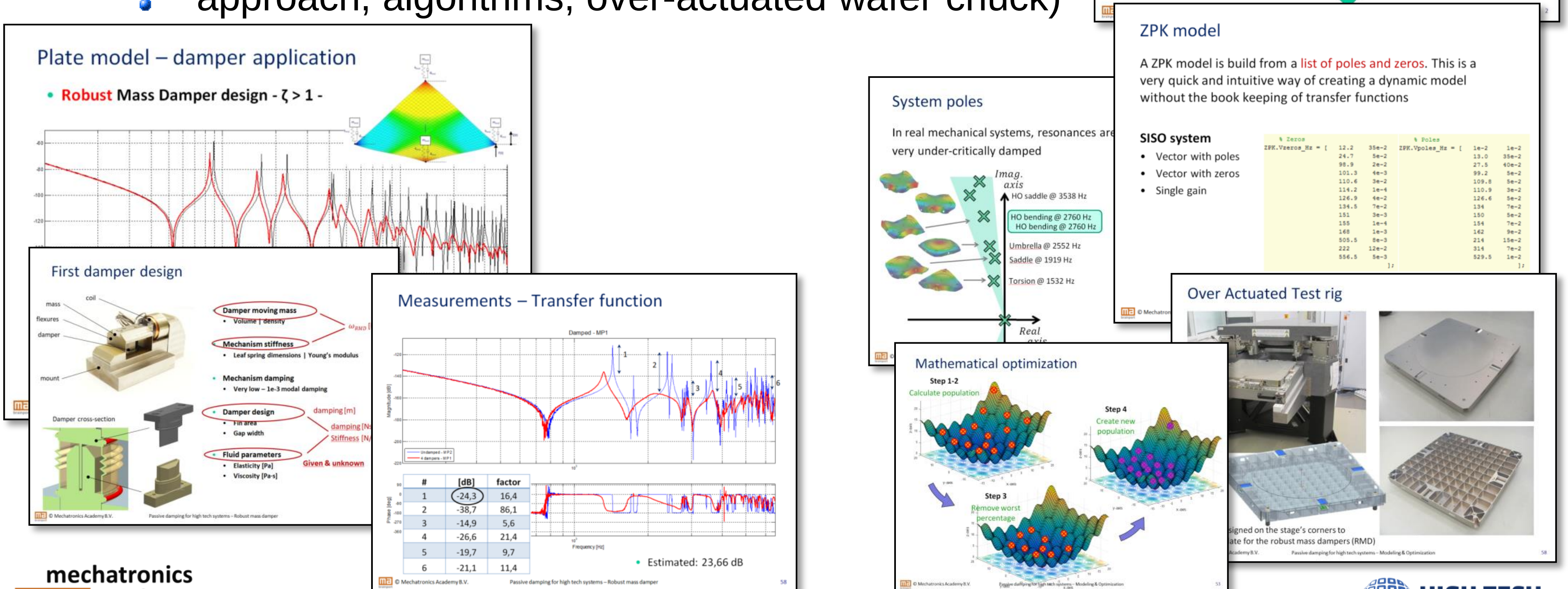
- Demo & Exercise CLD
- CLD for Discontinuous Surfaces



Day 3 (morning): RMD & Modelling

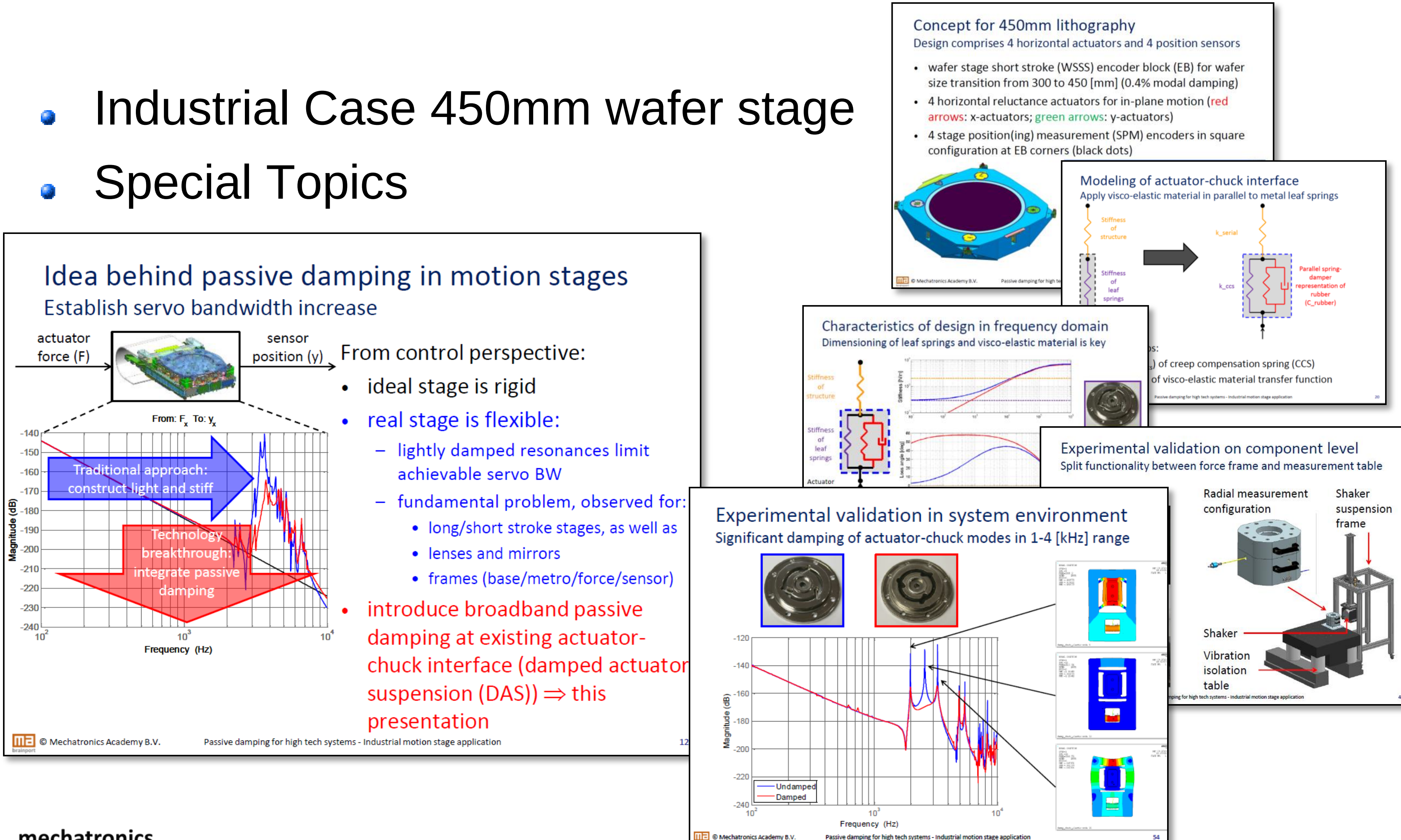
- Robust Mass Damping
  - design, testing, semiconductor wafer stage)
- Integral Modelling & Optimization
  - approach, algorithms, over-actuated wafer chuck)





Day 3 (afternoon): Ind. Case & Specials

- Industrial Case 450mm wafer stage
- Special Topics



Sign up for this training

Via the website of our partner

High Tech Institute