



# SEMINAR

APPLIED MATHEMATICS AND MECHANICS

FS1023

24 November 2025

A DCAMM seminar No. 798 will be presented by

**Professor Paolo Gardonio**  
**Dept. of Electrical Management and Mechanical Engineering**  
**University of Udine, Italy**

The title of the lecture is

**In-vacuo structured fabrics for adaptive vibration control**

**Abstract:**

A new class of composite structures has recently emerged, consisting of core structured fabrics wrapped in a deflated plastic skin. Unlike traditional knitted/woven fabrics made from fibers or wires, structured fabrics are composed by a framework of interlocked truss-like particles that form a chain mail. These structures exhibit a fluid-like state at ambient pressure. However, once encased in a deflated bag, they show a solid state whose stiffness can be finely tuned by varying the level of vacuum in the bag.

The talk is divided into three parts. The first part shows how these fabrics are made and discusses their working principles and mechanical properties with respect to the vacuum level and the geometry/dimensions/number of core fabrics. The second part presents a practical application where a beam-like in-vacuo fabric is mounted on a post to form a Tunable Vibration Absorber, which can be used to control the resonant response of structures subject to broad-band excitation. Finally, the third part discusses the implementation of a local self-tuning approach for this Tunable Vibration Absorber, which maximises the time-averaged vibration power absorption with an extremum seeking control algorithm.

DATE:	<b>Monday, 8 December 2025</b>
TIME:	<b>15:00 – 15:45</b>
PLACE:	<b>Building 414, Room 061E</b> <b>DTU, Technical University of Denmark</b>

Danish pastry, coffee and tea will be served 15 minutes before the seminar starts.

All interested persons are invited.

Jan Becker Høgsberg

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