

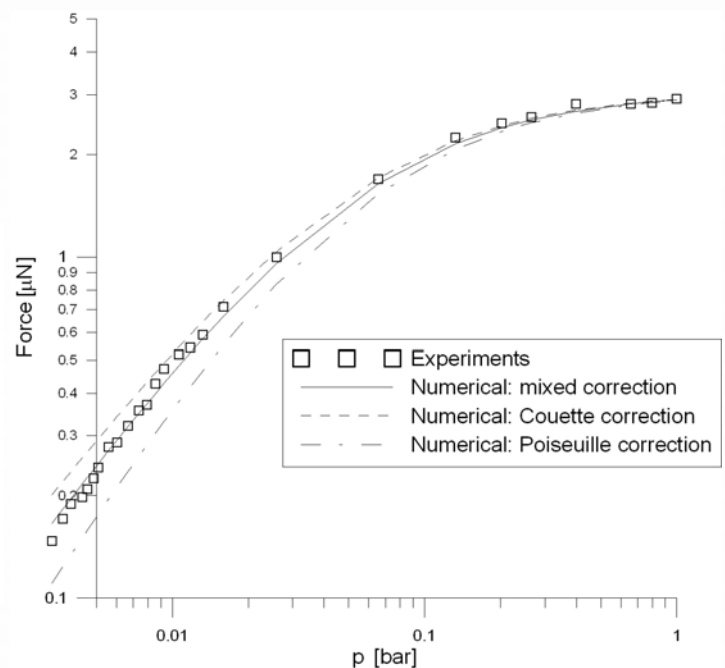
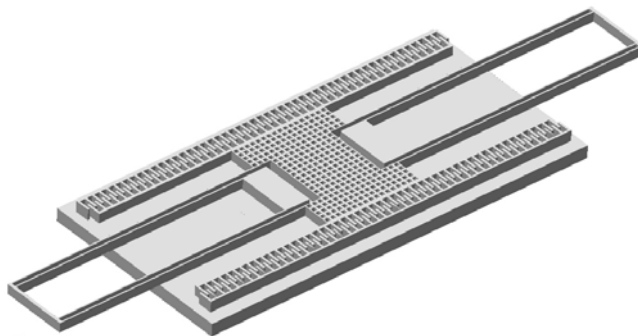
Simulation of damping in MEMS over the whole working-pressure range

Objective

Accurate evaluation of damping exerted on the structural parts of MEMS resulting from the surrounding gas and/or internal dissipation mechanisms. Application to existing MEMS at different pressures

Partners involved

Politecnico di Milano (POLIMI)
CCLRC
Lancaster University
Coventor
STM



Summary of results

- POLIMI applied BEM models for 3D slip flow regimes and compared with data provided by STM on biaxial accelerometer (down to 10^{-3} bar) and Tang resonator (down to 10^{-4} bar) employing kinetic corrections based on analytical solutions to match data at low pressures (see Figure)
- CCLRC investigated application of R13 equations
- LANCASTER proposed a thermodynamical modelling of Cosserat rod including relaxation time

Offer to industry

Evaluation of damping forces on MEMS prototypes via new software tools; automatic and efficient estimation of quality factors

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Project status, date completed