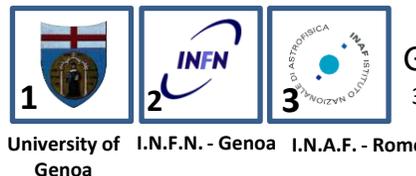


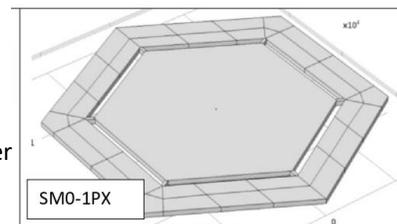
First structural tests of the CryoAC Detector silicon chip of the Athena X-ray observatory

L. Ferrari Barusso^{1,2}, P. Tarassi, S. Tugliani, M. De Gerone², M. Fedkevych², G. Gallucci², F. Gatti^{1,2}, M. Rigano¹, A. Argan³, D. Brienza³, M. D'Andrea³, C. Macculi³, G. Minervini³ and L. Piro³.

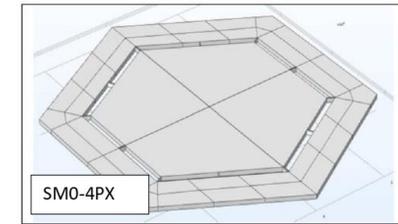


University of Genoa I.N.F.N. - Genoa I.N.A.F. - Rome

1-Pixel a Monolithical hexagonal freestanding silicon absorber of 500 μm thickness.

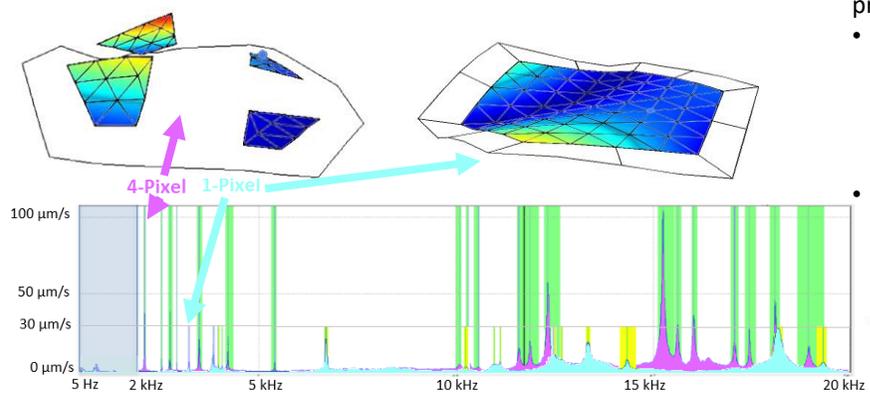
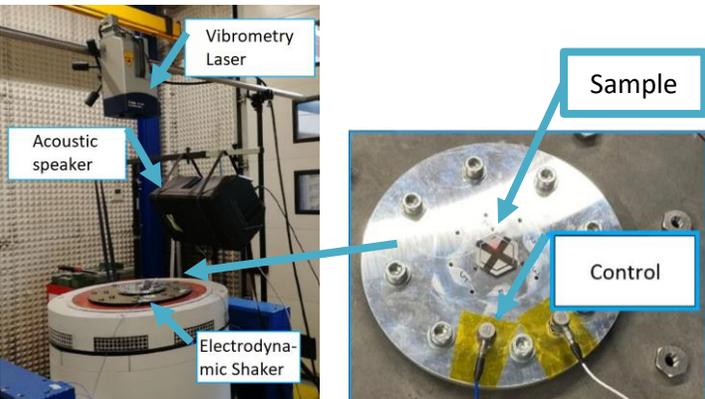
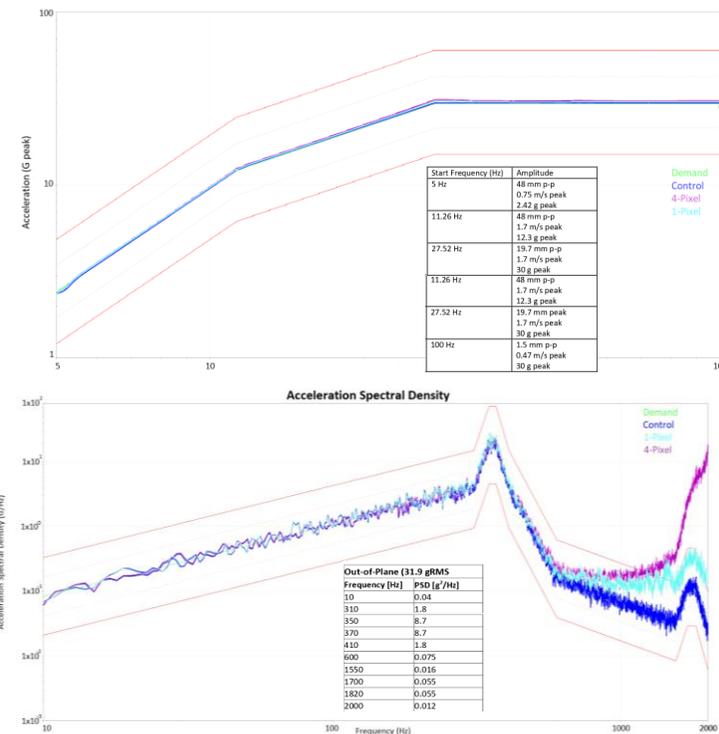


4-Pixel, four different freestanding silicon absorber of 500 μm thickness separated a 25 μm trench.



Qualification vibration masks provided by CNES for the ARIANE 6 project:

- Sine load test at low frequency (5 Hz – 100 Hz) where response are the same of the expected ones as in that region the Silicon response is flat.
- Random load test between 10 Hz and 2 kHz. Here the effect by the first resonance mode produce an evident increment in silicon acceleration in respect to the flange.



All the sample of both geometries passed the qualifications vibration tests without any crack. So, both the geometries are valid from a structural point of view to build the detector.

The 4-Pixel configuration have been demonstrated less safe as the first resonance peak is just above 2 kHz. Direct excitation of the first resonance mode led to sample breakage.