TriboAir setup

The tests have been performed by means of the TriboAir setup. In these tests the two samples are maintained in contact with a constant normal load, then, keeping the upper sample fixed, a specific displacement law is applied to the lower sample. In particular, the provided data refer to deceleration tests where the signals are recorded during a deceleration phase from 20 mm/s to 0.

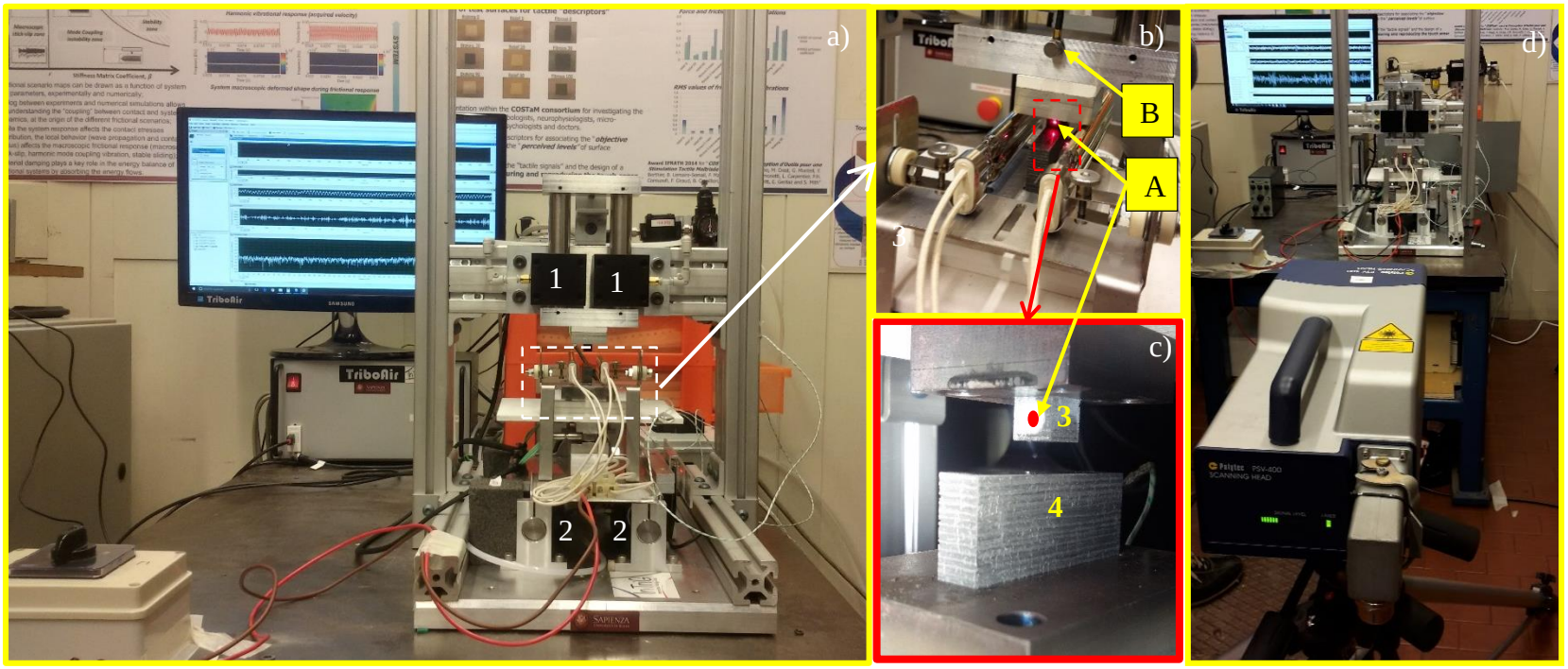
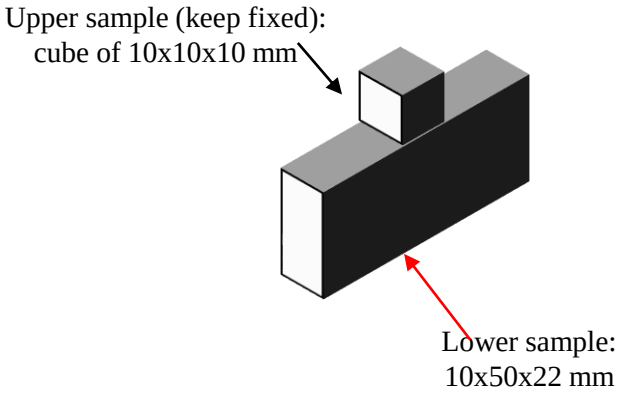
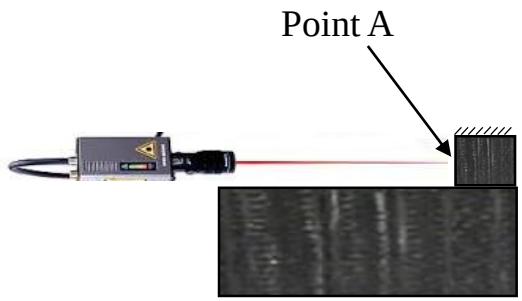


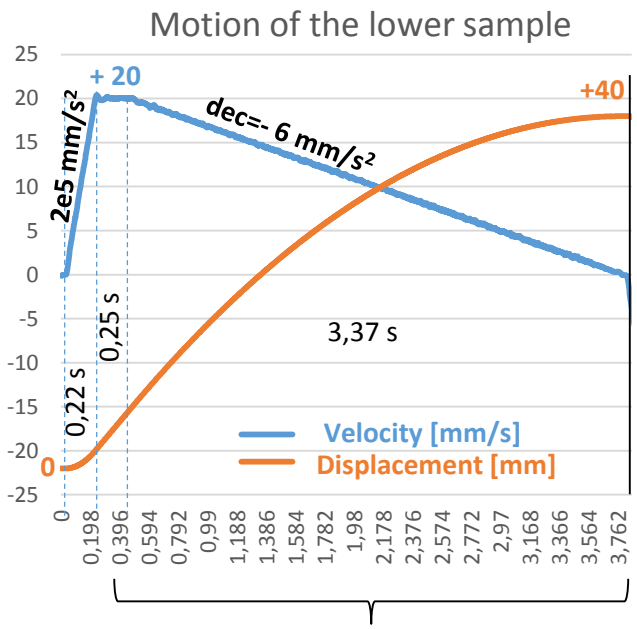
Figure 1: TRIBOAIR setup ;#1 vertical air guides, #2 longitudinal air guides;
b) A, laser vibrometer measurement point; B accelerometer measurement point.
c) #3 upper sample (fixed) , #4 lower sample. D) laser vibrometer.

Test parameters





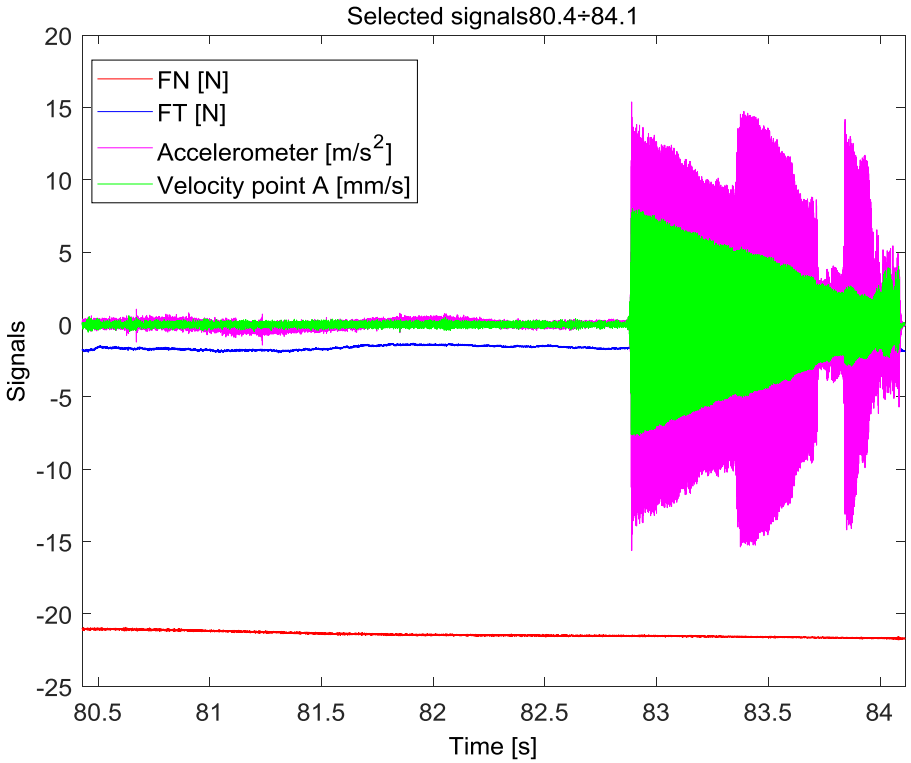
V =20 → 0 mm/s (deceleration)



Time interval of the recorded signals

Recorded signals

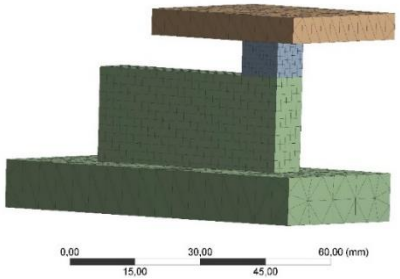
The main recorded signals are the normal and tangential force, the velocity of the point A of the upper sample (measured by a laser vibrometer) and the acceleration of the point B (Figure 1b).

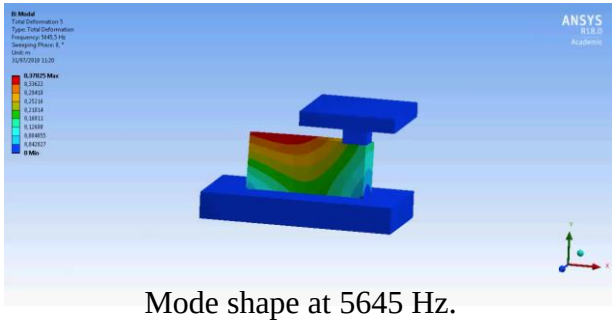


Example of the evolution of the signals: test_1_V20_0 (Deceleration from 20mm/s to 0 mm/s)
All the signals have been recorded with a sampling frequency of **100 kHz**.

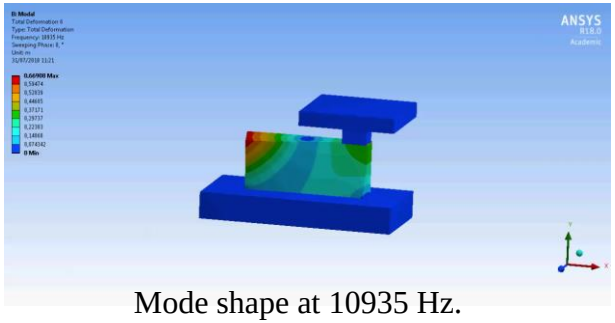
Two test signals (*Signals_test_n_1* and *Signal_test_n_2*) and related friction coefficients are provided.

Numerical modal analysis
(of the two samples in sliding contact)

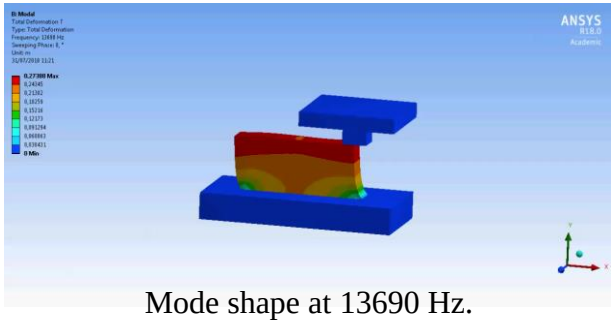




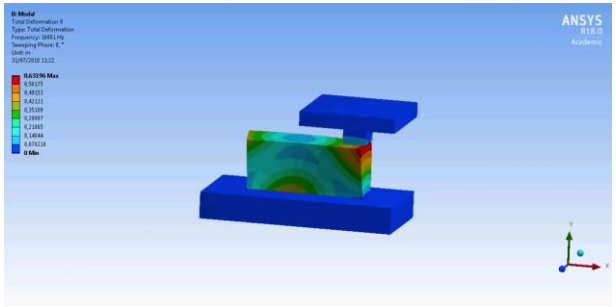
Mode shape at 5645 Hz.



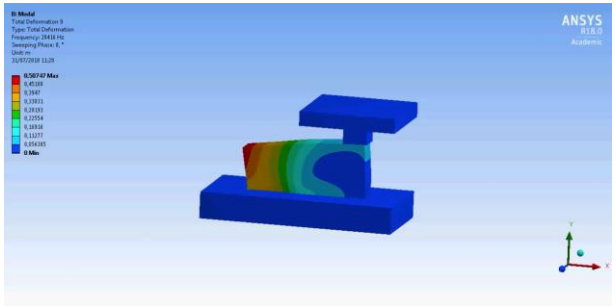
Mode shape at 10935 Hz.



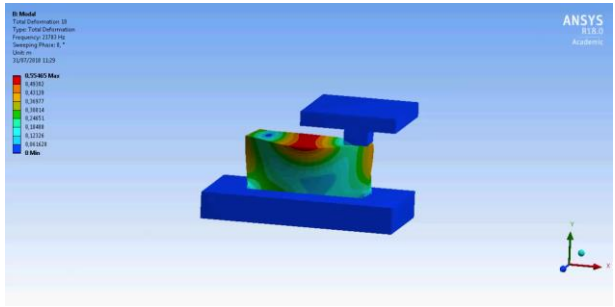
Mode shape at 13690 Hz.



Mode shape at 16081 Hz.

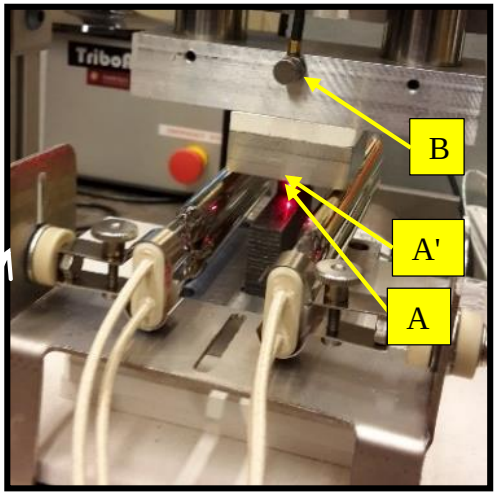


Mode shape at 20416 Hz.

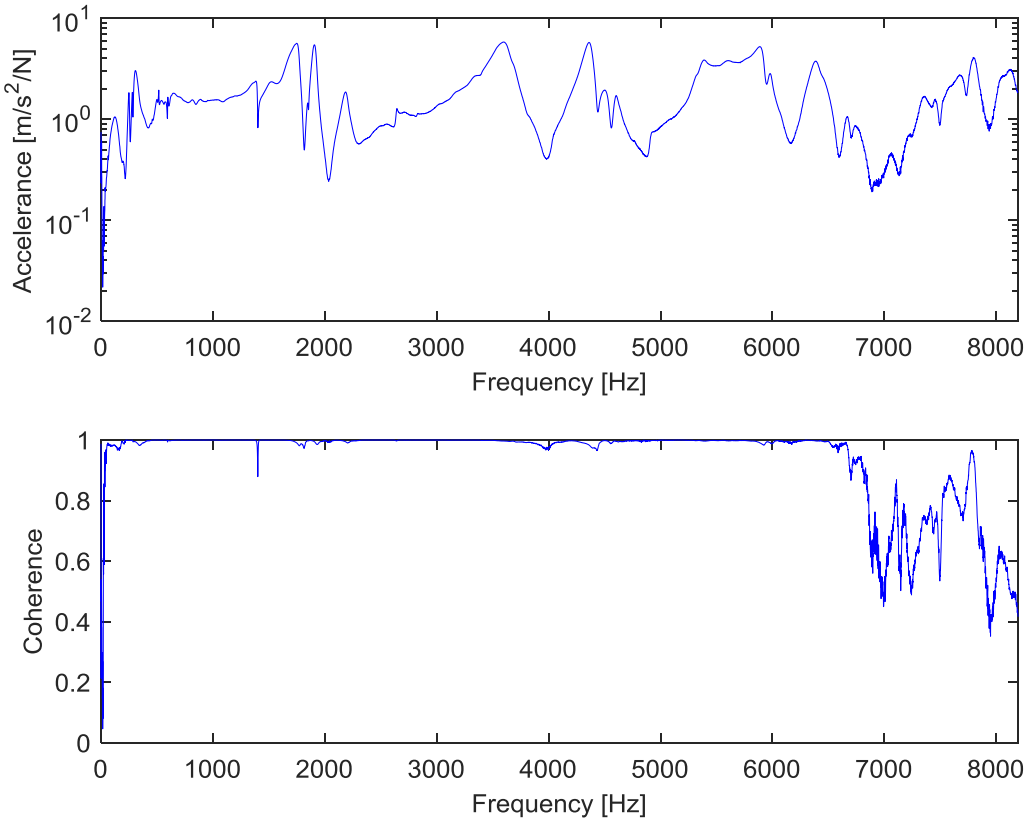


Mode shape at 23783 Hz.

Experimental frequency response function of the TriboAir setup



Transfer accelerance between point A' and point B



Provided datasets

Test #1

Signal_test_n_1.fig
Signal_test_n_1.mat (1st column:time;2nd velocity point A; 3rd Acceleration point B; 4th Tangential force; 5th Normal force)

friction_coefficient_test_1.fig
friction_coefficient_test_1.mat

Test #2

Signal_test_n_2.fig
Signal_test_n_2.mat (1st column:time;2nd velocity point A; 3rd Acceleration point B; 4th Tangential force; 5th Normal force)

friction_coefficient_test_2.fig
friction_coefficient_test_2.mat

TriboAir

Accelerance A'-B.fig
Accelerance A'-B.mat