Table 2: Measured and predicted resonance frequency for two different materials

Resonance frequency (Hz)	Elastomer	Nylon 6
Measured	62	66
Predicted	62	74

The slight discrepancy between model and experiment is certainly due to: (i) the resonance itself, which perturbs the experimental signals especially near the peak of the curve, (ii) the assumption of constant viscoelastic properties, which should rigorously depend on the frequency.

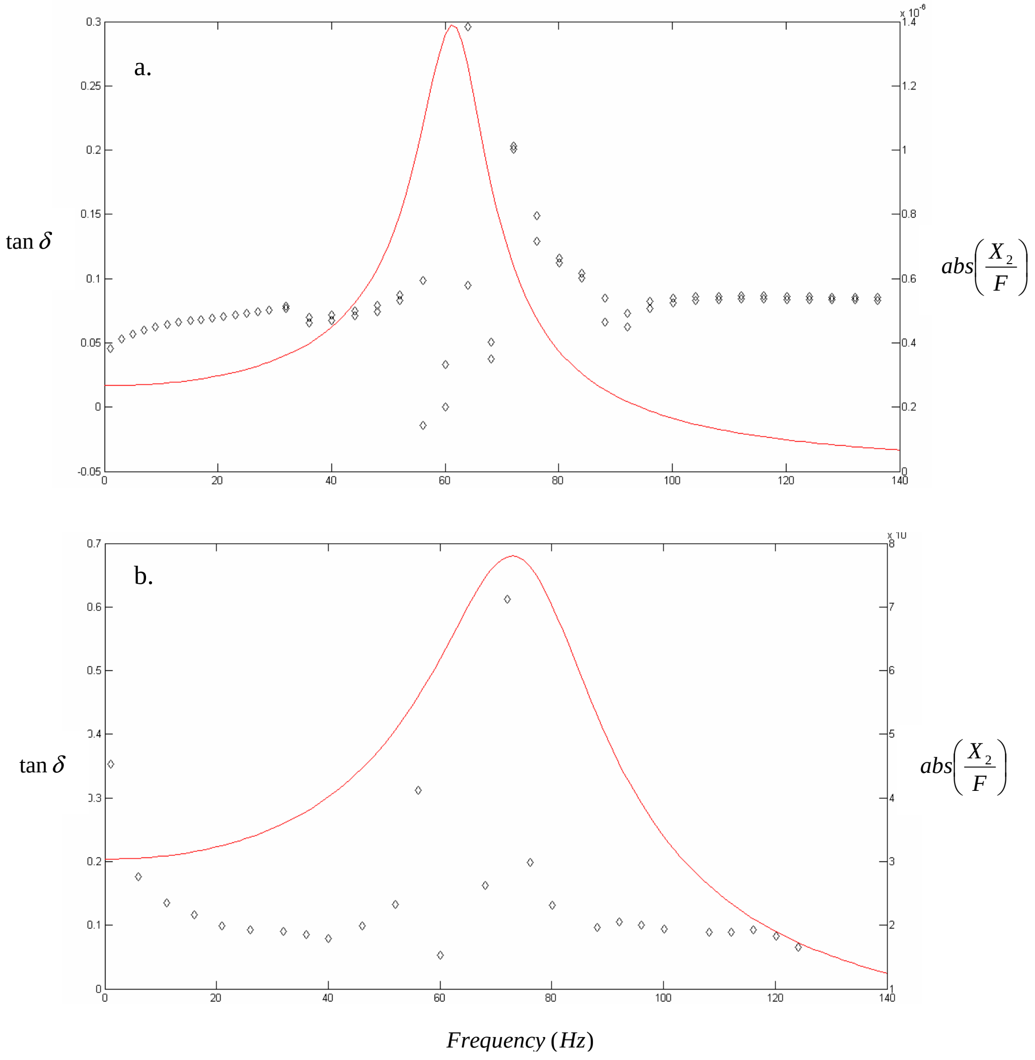

Fig. 5: Experimental values of the loss factor (Diamonds) and model prediction of $abs\left(\frac{X_2}{F}\right)$ (Solid line).

a.- Elastomer b.- Nylon 6

Abacuses for users were constructed to identify the suitable range of excitation frequencies according to the sample stiffness and the load sensor stiffness (Fig. 6).

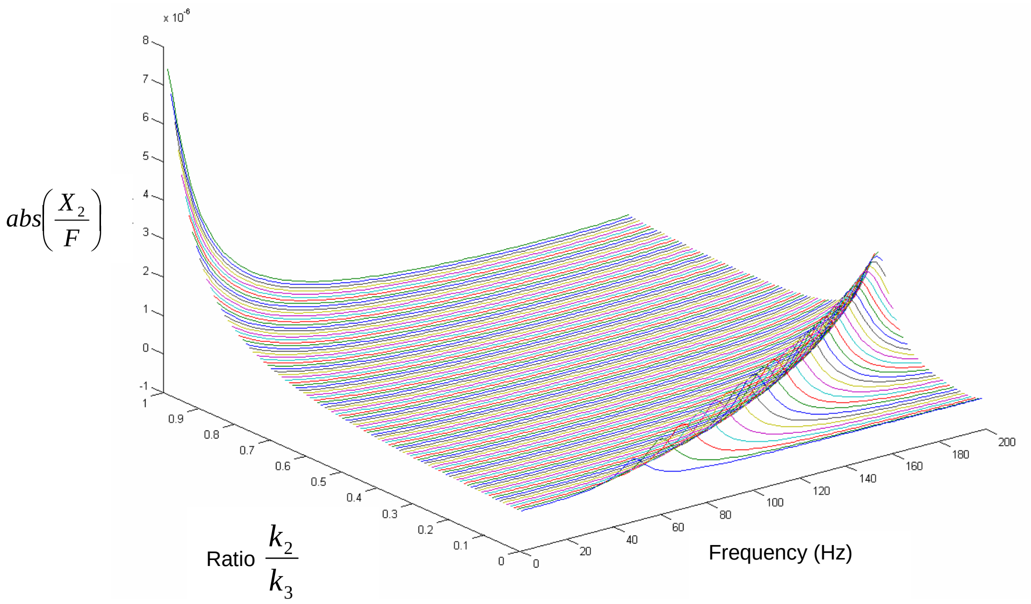

Fig. 6: Abacus plotted using modelling – Suitable field of excitation frequencies according the ratio k_2/k_3

4 Conclusion

The Dynamic Mechanical Analysis is commonly considered as a non-resonance technique. However, on the typical excitation frequency range (from 0.01 Hz to 200 Hz), and whatever the apparatus, the sample and the geometry, some resonance phenomena inevitably appear. At the resonance frequency, the measured sample properties are highly affected by the dynamic behaviour of the measuring column. In this study we proposed a straightforward model able to correct the measurements performed closed to the resonance frequency or to predict the value of the resonance frequency in order to avoid testing this frequency range during the dynamic mechanical analysis.

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