**EXPERIMENTAL INVESTIGATION IN WIND EFFECT ON A MODEL OF A BUILDING**

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The purpose of this project is to investigate the aeroelastic response over a circular cylinder with one free end. To avoid structural damage it is needed to know under what conditions oscillations at what amplitude occur. Wind tunnel experiments are performed through seven oscillating full-aeroleastic models with different geometries and mass distributions.

The technique developed for the measurements, is based on recording the cylinder motion with the High Speed Camera; paying attention in the point of the maximum displacement. The natural frequency and the logarithmic decrement on each model have been also determined experimentally, identifying the non-dimensional numbers that govern the instabilities and allowing us to compare the experimental data across-wind direction with the analytical values given by the Eurocodes.

The results indicate the importance of the fixation conditions to obtain a reliable natural frequency value. Only when the aspect ratio is bigger than 7.5 the oscillations across-wind direction are dominant. The maximum value 1.7 [mm] is obtained over a model of 9.7 aspect ratio and diameter of 3 [cm]. The addition of mass for the model that presents the maximum amplitudes results as a mechanism to reduce the order of three times the across-wind oscillation. Even though the vortex shedding are acting on the structures, due to relative high values of the logarithmic decrement not lock-in phenomenon are observed in the models. Thus from the graphs of oscillation amplitudes at different velocities it has to be concluded that the vibrations are induced by the motion of the structure.

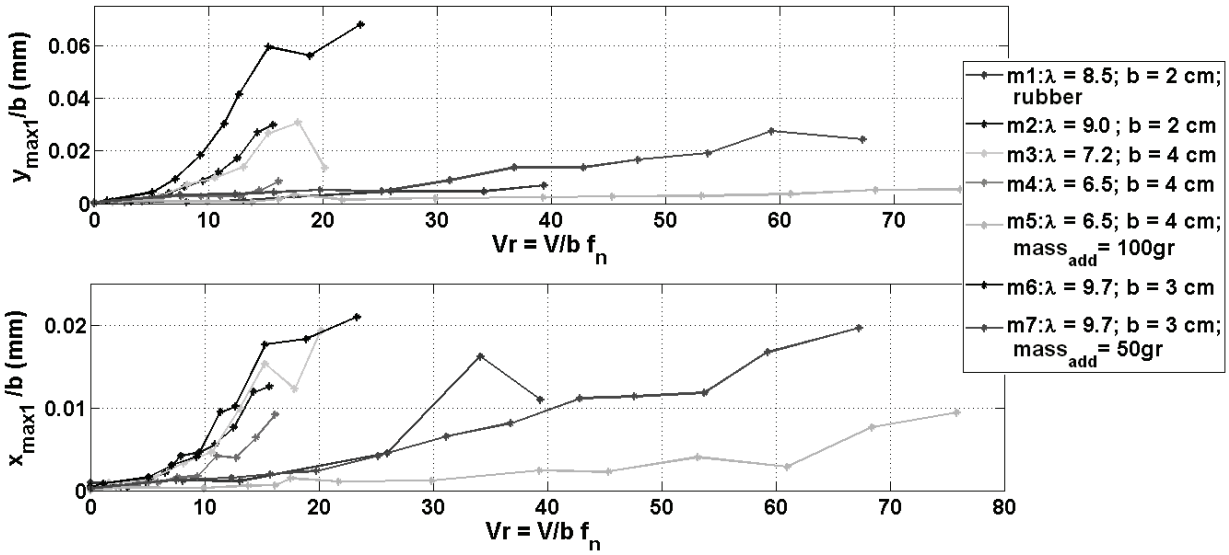


*Figure 1: Maximum non-dimensional oscillation amplitudes in across and along-wind directions*