

# Passive control of tubes by crosscorrelation of ambient noise fields

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**Abstract :** The tube or pipeline are used for the routing of the fluids such as gas, oil or water. The tubes deteriorate during its life. This deterioration can reveal defects, from where need for controlling of such structure. It is interesting to be able to detect damages in tubes by using a passive control method. The goal of this work is to show in experiments the possibility of using the function of cross correlation, between two signals of noise, in order to make a passive control of the tubular structures. The noise in the tube was generated by flow of fluid. The reproducibility of the function of cross correlation and its sensitivity to the presence of a defect, were checked for several frequencies in the frequently band of [200 Hz, 35kHz]. Moreover, the movement of the fluid in the tube generates a temperature variation; the influence of this temperature variation on the cross correlation function was studied.

**Keywords :** Green function, ambient noise, cross correlation, tube, flow fluid