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Correlation between FEM calculated and on site measured natural frequencies

In the last years, the ship builder trend is to realize light structures in order to optimize the weight distribution on board. Since the early stage of the ship design process is very important to understand the dynamic behaviour of the different typology of ship structures.

For this reason, the importance of an accurate prediction analysis of the natural frequencies has become fundamental, as the resonance phenomena, that can occur due to the structure geometry and main exciting sources present on board, have a dramatic consequence on the vibration levels amplitude.

This typology of problem is faced by performing FEM analysis but, due to the complexity of ship structures, it is also important to verify the FEA obtained results by measurements of the natural frequencies and mode shapes on board during the different phases of the construction. This paper will show the methodology and procedure for natural frequencies measurements and also the correlation between the FEM predicted and on site measured natural frequencies.

As final result of this analysis, the level of accuracy between the theoretical model and real structural response of the ship structures will be established.

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