# Comparative Analysis of the Deck of a Cable-Stayed Railway Bridge Under the Effects of Wind: Experimental Tunnel Section Model and Computational Fluid Dynamics

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## Abstract:

Cable-stayed bridges are very sensitive to wind effects, both in the construction and service phases. Cable-stayed bridges can also exhibit vibration phenomena such as vortex shedding at low wind speeds or instabilities at high speeds such as flutter. This paper presents the experimental wind tunnel study of a section model of a railway cable-stayed bridge carried out to determine its aerodynamic coefficients (drag, lift and moment). On the other hand, the flow around the deck models is modeled numerically using a RANS approach to derive the same coefficients, as well. The results are compared with the experimental values obtained in the wind tunnel. It is concluded that in the present state of CFD simulations, reliable results may be obtained depending on simulation parameters. This work was developed for the Ministry of Infrastructure, Communications and Transport of Mexico.