## Abstract Submitted for the DFD13 Meeting of The American Physical Society

Performance test of a low cost roof-mounted wind turbine<sup>1</sup> BERNARDO FIGUEROA-ESPINOZA, Universidad Nacional Autónoma de México, ROBERTO QUINTAL, Universidad Autónoma de Yucatán, CLÉMENT GOURIOU, Orleans Polytech Engineering School, ALICIA AGUILAR, Universidad Michoacana de San Nicolas de Hidalgo — A low cost wind turbine was implemented based on the ideas put forward by Hugh Piggot in his book "A wind turbine recipe book," where such device is developed using materials and manufacturing processes available (as much as possible) in developing countries or isolated communities. The wind turbine is to be mounted on a two stories building roof in a coastal zone of Mexico. The velocity profiles and turbulence intensities for typical wind conditions on top of the building roof were analyzed using numerical simulations (RANS) in order to locate the turbine hub above any recirculation and near the maximum average speed. The coefficient of performance is going to be evaluated experimentally by measuring the electrical power generation and wind characteristics that drive the wind turbine on the field. These experimental results will be applied on the improvement of the wind turbine design, as well as the validation of a numerical simulation model that couples the wind characteristics obtained through CFD with the Blade Element Method (BEM) and an electro-mechanical model of the turbineshaft-generator ensemble.

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