



SDI Review Form 1.6

Journal Name:	Current Journal of Applied Science and Technology
Manuscript Number:	Ms_CJAST_45332
Title of the Manuscript:	Aeroelastic analysis of an atypical geometry building by solving fluid-structure interaction problem through load transmission method
Type of the Article	

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PART 1: Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
Compulsory REVISION comments	- In [16], aeroelastic analyses were reported for the tall building CAARC. What would be the main improvements of this work compared to [16] (for example, faster computation, higher accuracy, simpler, etc)? Would the method proposed in [16] work for this atypical building model? Why is the method "suitable for structures under wind pressures that are not considered in the codes"? LES is used for the turbulent simulation. It is not clear how the unresolved scales are modelled. Also, it is claimed that the method is applicable to any building's geometry. What does it mean? Is the work in [16] restricted to some structures only? - A more careful literature reviewed is needed. For example, recent developments of FSI need to be updated (lines 39-46). The references seem to be old. Many methods have been developed for turbulence simulations with advantages and disadvantages. Why LES is chosen? Direction time integration methods for structural dynamics need to be reviewed (for example, Hughes TJR 1987, Dokainish MA 1989, Subbaraj K 1989, Katsikadelis, J. 2014, etc). - Line 275-277: "For the CAARC model, 100s of analysis were performed, while, for the atypical geometry building, five seconds of analysis were performed". What is the reason behind? Is the flow fully developed in such the short time? - Line 376-377: "The methodology does not demand a great computational power, instead, the aeroelastic analysis does not require long computer time to finish once the pressures have been properly assigned". It is more interesting to report explicitly.	- The computer process is faster, and the methodology for the analysis is simpler. - It should work for the atypical building model, but it would be difficult to build a mesh suitable for the complex geometry building. - The method has shown its capability to solve structures with complex geometries with the presented atypical geometry model that could not have been solved with the use of the current codes. – - The large-scale motions (large eddies) of turbulent flow are computed directly and only small-scale motions are modelled. - It means that the methodology can be use for any building's geometry, even though the solution might get complicated depending on the complexity of the geometry, it still can be solved since the mesh size is solved automatically. - The proposed method in [16] is not restricted to any structure, the commentary is referred to the restrictions presented in the codes. - The references give essential information; hence, we cannot remove them without taking away some essential concepts. Some references were added to reinforce the literature review. Some direct time integration methods are now reviewed. - LES was chosen after an extensive review of the methods for turbulence simulations due to the following points: - The scale modelling in LES results in a significant reduction in computational cost compared to DNS. - LES is more accurate than the RANS approach since the large eddies contain most of the turbulent of the turbulent energy and are responsible for most of the momentum transfer and turbulent mixing. And LES captures these eddies in full detail directly whereas there are modelled in the RANS approach. - The small scales tend to be more isotropic and homogeneous than the large ones, and this modelling sub-grid scales motions should be easier than modelling all scales within a single model as in the RANS approach. Note: Therefore, LES is the most viable numerical tool for simulating turbulent flows for the best of our understanding. - The flow isn't fully developed. The purpose was to show the capability of the method to solve the problem even for atypical geometries, and it was observed that the aeroelastic behaviour of the building was well presented with that short period of time, thus, it was enough for the proposed objectives. With the CAARC model was necessary to fully develop the flow since the conditions were taken from the literature, thus it was necessary to recreate the conditions in order to compare the results. - The explanation has been improved.
Minor REVISION comments	- The boundary conditions are not specified for numerical models. - Inconsistent notations: u and p are already used in Eqs. (1, 2) to indicate the velocity and pressure. In Eq. (3), u is used to indicate the displacement vector. What is p(t)? Also, the time derivatives are denoted differently between Eq. (2) and Eq. (3). - What is the time discretization for the Navier-Stokes? Reynolds number and the density are not specified. - Section 2.2 (Lines 84-113) does not have an optimal structure. There is no section 2.2.2, why is section 2.2.1 needed? It is the same for 2.2.1.1. - Misprints can be found at many places Abstract: ... and leads to... Line 21: ... depends mainly on Line 48: ... can be summaries... Line 193: ... wind velocities Line 199: ... by the following equation, Line 200: no equation is given. - Line 84: "Numerical model" is switched suddenly to "An analytical model" (Line 86)	- The boundary conditions are now specified for numerical models. - The notation has been changed. P(t) has been described. The time derivatives are denoted different because for eq. (2) denotes spatial derivative, and for eq. (3) denotes material derivative. - Reynolds number and the density are now specified. - The numeration of the sections has been improved. - Corrections made - Mistake corrected. - We agree, but we do not have the necessary data for plotting the results of [16]. - References for proposed solvers are now presented. - The parameters are proposed by the software algorithm in function of the geometry of the building. The virtual wind tunnel dimensions cannot be modified. - We agree, but for the purpose of this work we consider it not necessary. - Load transmission method was more emphasized.



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	7. Section 3.1. It is recommended to have plots side-by-side when two methods are compared. 8. Line 130-132: References to the two fluid solvers are needed. The same for Sap2000 (line 145). 9. Line 183-189: What are the reasons behind the parameters? Can one choose larger or smaller virtual wind tunnel? 10. Line 280. Fig. 7. It can be interesting to see the velocity with turbulence as well. 11. The load transmission/transfer method needs to be better emphasized.	
<u>Optional/General</u> comments	The proposed method solves fluid model and the structure model separately by using the load transfer/transmission method. A scheme or a graphical abstract can describe the process better.	We agree, but the team has decided not to present the scheme since it is optional.

PART 2:

	Reviewer's comment	Author's comment <i>(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
Are there ethical issues in this manuscript?	<i>(If yes, Kindly please write down the ethical issues here in details)</i>	There are no ethical issues in the manuscript.