



SDI Review Form 1.6

Journal Name:	British Journal of Applied Science & Technology
Manuscript Number:	Ms_BJAST_22578
Title of the Manuscript:	FLUID-STRUCTURE INTERACTION AND AEROELASTIC BALANCE ON THE ANALYSIS OF A TALL BUILDING WITH IRREGULAR GEOMETRY
Type of the Article	Original Research Paper

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This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound.

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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)
<u>Compulsory</u> REVISION comments		
<u>Minor</u> REVISION comments		
<u>Optional/General</u> comments	This paper studies a complex IDFE problem for tall building with irregular geometry. As a summary paper, it is OK. It expresses the method used shortly and accurately in theory. A little bit more on describing the solving of coupled (7), (12), (13) [or (7), (14) ? (7), (22), (23)? (7), (26), (27) ?] in details is suggested. E.g., the process of iteration: starting point .→ Eq.(?)→Eq. (?).... As a creating paper, it should emphasize the creating point(s), which differs from and with advantage(s) over, or improves, the previous works. Suggestions: (1) Changing the displacement at top of model in wind channel test to that of prototype, and comparing with that obtained by ANSYS. (2) Give a short explanation on reasonable of results of moment at basement obtained by ANSYS and Dines+Gid. (3) Answer the key questions: How to judge (evaluation) the accuracy of a numerical method? (and also for, the similarity (or believability) of results between experimental model and prototype ?)	The equations 26 and 27 are solved in an iterative form during all the analysis interval, into a time step, the equation 26 is solved until to reach a convergence criterion for the velocity and pressure of the fluid, these criterion are mentioned in section 2.5, in analogue form is solved the equation 27 with its convergence criterion, finally the boundary (interface) between the domains is moved with the equation 20, in physics terms, the equation 26 solves the velocity and the pressure of the fluid, then the pressure is transferred to the structure as a boundary condition, next, the equation 27 solves the displacement of the solid which is used as boundary condition to move the mesh near of the boundary with equation 20. Point 1: We only measure the displacement at the top of the model for the next reason: the mass of the model is 0.293 kg and the mass of the sensor used in the wind tunnel is 0.055 kg about one sixth of the mass of the model, if we put the sensor in a lateral wall it can introduce a moment in the model, so we decided only put the



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	(4) Checking: (a) Line 2: "AEROLASTIC" or "AEROELASTIC" ? (b) Lines 80,106,121,190, 198: "....y..." or "....&...." ? (c) An equation should have an equal sign between the LHS and RHS, where is the equal sign and the RHS of Eq. (14) in line 105 ? (d) Line 153, where are Eq. (38) and (39) ? (e) Line 164, what is z, H ? (explanation). (f) Line 170: where is Eq. (46) ? (g) Line 178: what is K_M ?	sensor at the top of the model, the mass of the sensor was considered in the scaling of the prototype, in ANSYS we represent the sensor with an added mass at the top of the prototype. With a special sensor (lighter) is possible to measure displacements in any point but we do not have that technology. Point 2: There are two main reasons for the difference in the results presented here, the first reason is that ANSYS and DINES+GiD use different algorithms to solve the equations that represent the fluid-structure interaction, and the second is the mesh that we used to discretize the phenomenological equations, we use less elements in ANSYS than in DINES+GiD for the reasons explained in the conclusions of the manuscript. Point 3: The numerical algorithms are evaluated with benchmark models where is important the number of iterations that the algorithm needs to reach a convergence criterion, the CPU time that the algorithm needs is important too, ANSYS and DINES+GiD are programmed with algorithms that have been tested. The procedure that we use to scale the prototype appeared in a scientific article that was arbitrated and is recommended in some design codes. So, we believe in them, and we show as can be used in the design of an irregular building.
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		Point 4: In line 2 is "AEROELASTIC". In lines 80,106,121,190, 198 is "and". In line 105 the equal sign is in RHS. Line 153 refers to the equations 22 and 23. In line 164, H is the total height of the structure and z is a height between H and zero. Line 170 refers to the equation 30. K_M is a ratio between the bending moment at the basement of the model and the prototype. All the corrections for the four point were made in the manuscript, we add few words to explain z, H and K_m, for this reason the original numbering of the lines has changed.
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