

Short Reports

A VERY POWERFUL TECHNIQUE TO CREATE LIFT FORCE (THRUST) ON VTOL AIRCRAFT

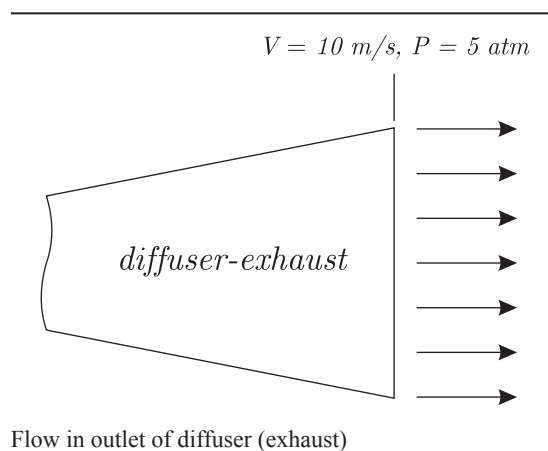
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To create a high lift force (thrust) with low power consumption and small size of power unit is very important for the aviation industry. In military aircraft vertical takeoff and landing is usually done with an extra engine (like the fighters Yak-36, Yak-38 and Yak-141) or an extra fan (like fighter F-35). The thrust equation for VTOL engine can be written as follows:

$$Thrust = mV_j + A_j(P_j - P_a)$$

First section of the equation is called the gross momentum thrust and second section is called pressure thrust, where m is mass flow, V_j is the jet velocity, A_j is exit area, P_j is exit pressure and P_a is atmospheric pressure. In the fighters mentioned above, the second section of the equation is zero ($P_j = P_a$) and all thrust is created by momentum thrust, but this method is not efficient, because high weight and volume and also high fuel consumption. If we can get more power by pressure thrust and minimal thrust by momentum thrust we will have a very efficient system for creating lift force (thrust) for using on VTOL aircraft.



In this paper, I am going to introduce a very powerful technique to create lift force (thrust), in this technique I used a stream of air (gas) at very low velocity (10 m/s) and very high pressure (5 atm) in outlet of diffuser which is an exhaust, see figure, in these circumstances outlet gases of diffuser (exhaust) are highly unstable, to stabilize the flow and fix this problem, I used an innovative technique that I have called it False Wall Technique (FWT), by FWT we have the quite stable flow and diffuser-exhaust create very high lift force (thrust) with very low fuel consumption by very small power unit.