Flexible Shape Changing (Morphing) Wing

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The Purpose for the research is comparing two airfoils; the data of a conventional airfoil, and the data of our self-made airfoil that will have flexibility. An airfoil is a cross-section representation of a part of a wing. Placing this cross section representation under specific conditions will help us determine if our airfoil meets the requirements for lift. Using this method allows us to confirm or deny our hypothesis without taking the time of building an entire wing. Our hypothesis is that a morphing airfoil can achieve greater lift that the NACA 0025 airfoil. When carrying out our procedures, we built a wing tunnel with straws on the end side to direct the airflow. Our source for wing speed was a home fan that gave us a speed rounding to about 5 mph. When placing our airfoil in the wind tunnel, we used the method of morphing, non-morphing, and changing the angle of attack to compare it to the NACA 0025 airfoil. Our data gave us wanted and unwanted results. Our wanted results were as such: we saw more lift through the morphing of the top and lower attenuators of our airfoil than from the non-morphing. Our un-wanted results were as such: we did not get more lift than the NACA 0025 airfoil, or in other word, we did not get lift at the same rate as the NACA 0025 airfoil. We determined that upon our data, our hypothesis was not correct, but parts of our results were as derided.

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