

## The Influence of Aerodynamic Drag in the Flight Phase of Long Jump Performance

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Three different air dynamics are employed when performing the long jump and each has a different impact on performance. In a variety of sporting events, aerodynamic forces have a considerable impact on strategy and performance records. This study is aimed at determining how much wind and air resistance contributed to long jump performance. Investigations were conducted on the relationship between the Drag force (D) and time for various flying techniques. Six male senior long jumpers' best performances at a national competition in Sri Lanka were considered for this study. Two of each technique's best performers were used to analyse (Kinovea 9.5 software) all three of the techniques. Two cameras were used to record the performances in the frontal and sagittal planes (100 Hz). The coordinates of each athlete's Centre of Gravity were examined for each frame from the take-off through the landing phase. Separately, the frontal plane and sagittal planes were used to complete the space calibration to get the frontal surface area of the body for each frame. The study calculated the aero drag force using the equations of Reynolds number and aerodynamic force. The drag force for each time frame for the three techniques fluctuated approximately between 7N to 11N. This leads to reduce the horizontal flight distance.

**Keywords:** *air resistance, body surface area, frontal plane, wind velocity*