

Abstract Submitted
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Aerodynamics of ski jumping flight and its control: I. Experiments¹ DAEHAN JUNG, Korea Air Force Academy, KYEONGTAE BANG, HEESU KIM, Seoul National University, EUNHYE AHN, Korea Air Force Academy, HAEICHEON CHOI, Seoul National University — In a ski jumping competition, it is essential to analyze the effect of various posture parameters of a ski jumper to achieve a longer flight distance. For this purpose, we construct a model of a ski jumper by using three-dimensional surface data obtained by scanning a ski jumpers body (Mr. Chil-Ku Kang, member of the Korean national team). An experiment on this model is conducted in a wind tunnel. We consider four posture parameters (forward leaning angle, ski opening angle, ski rolling angle, and ski spacing) and measure the drag and lift forces for various flight postures at various angles of attack ($\alpha = 0^\circ - 40^\circ$) and Reynolds numbers ($Re = 5.4 \times 10^5 - 1.6 \times 10^6$) based on the length of the jump ski. Then, we derive optimum values of posture parameters for maximum lift-to-drag ratio using a response surface method. We also conduct a full-scale wind tunnel experiment with members of the Korean national team and confirm the results obtained from the experiment on the model.

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