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**Measurements of the aerodynamic characteristics of the turbo-jav** KENTA YAMAMOTO, Kansai University Graduate School, TOMOYA NAKAJIMA, Osaka Prefecture University, TOMOAKI ITANO, MASAKO SUGIHARASEKI, Kansai University — The “turbo-jav” which is used for the javelic throw in the junior Olympic games has four tail fins. In order to investigate the aerodynamic characteristics of the turbo-jav with an emphasis on the effect of the fins, we performed wind tunnel tests, throwing experiments and numerical simulations of the flight for intact turbo-javs as well as turbo-javs with their fins cut. The wind tunnel tests showed that the drag and lift coefficients for the intact turbo-javs are larger than the corresponding values for the turbo-javs without fins. As the angle of attack increases from 0, the pitching moments for the intact turbo-javs decrease from 0, whereas the moments for the turbo-javs without fins increase. In accord with this property, the throwing experiments showed that intact turbo-javs fly stably with oscillating angle of attack around 0. The flight distance, the orbit and the variation of angle of attack for the intact turbo-javs launched by a launcher agree closely with the numerical simulation performed based on the wind tunnel tests. A comparison of throwing experiments by students and by the launcher suggested significant effects of the rolling motion of the turbo-jav on its flight characteristics.

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