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Flow behavior at different boattail angles of an axisymmetric body in low-speed regime. TRAN THE HUNG, TAKUMI AMBO, TAEKJIN LEE, Tohoku University, TAKU NONOMURA, Tohoku University, Presto, JST, KEISUKE ASAI, Tohoku University — A boattail, added to a blunt base of an axisymmetric body, is a well-known means for drag reduction and has been studied widely. Despite a huge number of investigations, the information relating to the effect of boattail angle on flow pattern at the slant surface in low-speed regime is still limited. To obtain more clearly flow behavior, an experiment on axisymmetric bodies with different conical boattail angles, ranging from 10 to 25 degrees, has been performed. A global luminescent oil-film skin friction meter was employed to extract skin friction and analyze the flow pattern. The skin friction results indicate three types of flow on the slant surface: unseparated at the angle of 10 degrees, separated and reattached at angles from 12 to 20 degrees and totally separated at the angle of 25 degrees. Interestingly, when angle increase from 12 to 20 degrees, the separation points stay nearly at the fixed position while reattachment points move downstream. An average skin friction value indicates an increase of skin friction magnitude inside and a decreasing trend behind the separation bubble as the result of increasing angles. At high angles, the flow fully separates near the boattail shoulder and the whole afterbody is located inside the wake region.

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