Abstract Submitted
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Role of Dimples on Golf Ball[1] JIN CHOI, WOO-PYUNG JEON, HAECHEON CHOI, Seoul National University — It is an open question why the drag coefficient on golf ball remains nearly constant with increasing Reynolds number after its sharp decrease. In order to investigate this interesting phenomenon, we measure the drag, separation angle, wall pressure and streamwise velocity inside/outside dimples before main separation. When drag reduction occurs with dimples, the separation angle measured is nearly constant even with increasing Reynolds number. Also, the wall pressure distributions outside dimples are nearly the same at different Reynolds numbers, although those inside dimples vary depending on the Reynolds number. From the streamwise velocity measurement, it is found that dimples located at the angles of $65^o \sim 90^o$ (three rows of dimples exist in our experimental setup) make an important role in changing flow characteristics. Inside one or two rows of dimples located at those angles, a small separation bubble exists and flow becomes quickly transitional and turbulent with reattachment. After the reattachment, the flow does not separate at the downstream dimples owing to fuller velocity profile. With dimples, the main separation occurs further downstream at 110 degree. This main separation angle does not change even with increasing Reynolds number, because downstream dimples do not make an important role in changing flow characteristics any more.

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