ABSTRACT

The paper describes an experimental investigation of the stator hub and blade flow in two different stators of a highly loaded single-stage axial-flow low-speed compressor. The first stator (A) is a conventional design with blades of rectangular planform. The second stator (K) is an unconventional, more advanced design with blades of a special planform, characterized by an aft-swept leading edge with increasing sweep angle towards hub and casing. The experimental results show that stator K exhibits a much better hub performance than stator A, finally leading to a better overall performance of stage K compared to stage A. The better hub performance of stator K is, primarily, the result of a planform effect of the newly introduced blades with an aft-swept leading edge and the aerodynamics of an aft-swept wing.