عنوان مقاله:

A Numerical Investigation on the Unstable Flow in a Single Stage of an Axial Compressor

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خلاصه مقاله:

An unsteady two-dimensional finite-volume solver was developed based on Van Leer's flux splitting algorithm in conjunction with "Monotonic Upstream Scheme for Conservation Laws (MUSCL)" limiters to improve the order of accuracy and the two-layer Baldwin-Lomax turbulence model was also implemented. Two test cases were prepared to validate the solver. The computed results were compared with the experimental data and a good agreement validated the solver. Finally, the solver was used for the flow through a multi-blade stage of an axial compressor in its off-design condition. The computed results showed a rotating stall-like instability with a periodic behavior. To investigate the flow properties during the instability condition, the flow pattern, Vortex properties and the axial velocity were studied. It was concluded that the instability vortices in the multi-blade cascade do not have the same generation history of the separated vortices over a single body.

کلمات کلیدی:

Flow Instability, Cascade Study, Finite, Volume, Axial Compressors

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