

This study presents a numerical simulation of the rotating stall phenomenon in axial and centrifugal compressors with detailed descriptions of stall precursors and its development with time. Results showed that the vaneless region of the centrifugal compressor is the most critical location affected by stall. It was found that the tip leakage flow and the back flow impingement are the main cause of the stall development at the impeller exit area for centrifugal compressors. The results of the axial compressor simulations indicated that the early separated flow combined with the tip leakage flow can block the impeller passages during stall.

