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Vortragstitel	Compressor Rig Test with Distorted Inflow using Distortion Generators
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Abstract	<p>At high angle of attack and in ground crosswind operation of an aircraft the turbofan engine is typically exposed to inlet distortions, either generated by the aircraft wing and fuselage or the inlet separation for instance. The need to assess the aircraft engine compatibility in an early stage of engine development is discussed at the beginning of the paper. The main part of the paper is the presentation of a compressor rig test performed at Technische Universität Darmstadt. The setup and motivation of the test, dedicated to address a certain distortion known to occur in rear fuselage nacelles, is explained. A distortion generator was designed by the Universität der Bundeswehr in Munich which was qualified in the present campaign. Special attention was directed towards the characterisation and quantification of the distortions by combining Kulite total pressure measurements and stereoscopic Particle Image Velocimetry in front of the transonic rotor. The Particle Image Velocimetry measurements identified counter-rotating vortex pairs behind the distortion generator which decay rapidly in the accelerating flow in front of the rotor. The Kulite measurements showed the local character of the total pressure distortion and frequency spectra were calculated in the area of vortex shedding. Comparisons of the Kulite measurements in front and behind the rotor demonstrate the changes in shape of the distortion while travelling through the rotor. High resolution measurements of the total pressure ratio used to determine the compressor map show increased pressure ratios accomplished by an increase in total temperature in a sector behind the distortion generator slightly shifted circumferentially in direction of the rotor rotation. Compressor speed lines dropped to a lower pressure ratio caused by the pressure drop of the distortion generator, while the stability was mainly unaffected.</p>