

<b>Title</b>	<b>Optical measurement of acoustic pressure amplitudes—at the sensitivity limits of Rayleigh scattering</b>
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<b>Abstract</b>	<p>Rayleigh scattering is a measurement technique applicable for the determination of density distributions in various technical or natural flows. The current sensitivity limits of the Rayleigh scattering technique were investigated experimentally. It is shown that it is possible to measure density oscillations caused by acoustic pressure oscillations noninvasively and directly. Acoustical standing waves in a rectangular duct were investigated using Rayleigh scattering and compared to microphone measurements. The comparison showed a sensitivity of the Rayleigh scattering technique of 75 Pa (<math>7 \cdot 10^{-4}</math> kg/m<sup>3</sup>) and a precision of 14 Pa (<math>1 \cdot 10^{-4}</math> kg/m<sup>3</sup>). Therefore, it was also shown that Rayleigh scattering is applicable for acoustic measurements.</p>
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