

Abstract Submitted
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Application of Lorentz force techniques for flow rate measurement RESCHAD JOHANN EBERT, CHRISTIAN RESAGK, Tech Univ Ilmenau — We report on the progress of the Lorentz force velocimetry (LFV): a contactless non-invasive flow velocity measurement technique. This method has been developed and demonstrated for various applications in our institute and in industry. At applications for weakly conducting fluids such as electrolytes with conductivities in the range of 1 – 10 S/m the challenging bottleneck is the detection of the tiny Lorentz forces in the noisy environment of the test channel. For the force measurement a state-of-the-art electromagnetic force compensation balance is used. Due to this device the mass of the Lorentz force generating magnets is limited. For enabling larger magnet systems and for higher force signals we have developed and tested a buoyancy based weight force compensation method which will be presented here. Additionally, results of LFV measurements at non-symmetric fluid profiles will be shown. By that an evaluation of the feasibility of this measurement principle for disturbed fluid profiles that are relevant for developing the LFV for weakly conducting fluids towards industrial applications can be made. Additionally a prospective setup for using the LFV for molten salt flows will be explained.

Reschad Johann Ebert
Tech Univ Ilmenau

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