Abstract Submitted
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Weighted least-squares solver for determining pressure from particle image velocimetry data[1] ROELAND DE KAT, University of Southampton — Currently, most approaches to determine pressure from particle image velocimetry data are Poisson approaches (e.g. de Kat & van Oudheusden, 2012, *Exp. Fluids* 52:1089–1106) or multi-pass marching approaches (e.g. Liu & Katz, 2006, *Exp. Fluids* 41:227–240). However, these approaches deal with boundary conditions in their specific ways which cannot easily be changed—Poisson approaches enforce boundary conditions strongly, whereas multi-pass marching approaches enforce them weakly. Under certain conditions (depending on the certainty of the data or availability of reference data along the boundary) both types of boundary condition enforcement have to be used together to obtain the best result. In addition, neither of the approaches takes the certainty of the particle image velocimetry data (see e.g. Sciacchitano *et al.*, 2015, *Meas. Sci. Technol.* 26:074004) within the domain into account. Therefore, to address these shortcomings and improve upon current approaches, a new approach is proposed using weighted least-squares. The performance of this new approach is tested on synthetic and experimental particle image velocimetry data. Preliminary results show that a significant improvement can be made in determining pressure fields using the new approach.

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