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Erratum:

Uniform preconditioners for the time dependent Stokes problem

Kent–Andre Mardal[1], **Ragnar Winther**[2]

[1] Department of Scientific Computing, Simula Research Laboratory and Department of Informatics, University of Oslo, P.O. Box 134, NO-134 Lysaker, Norway, e-mail: `kent-and@simula.no`

[2] Centre of Mathematics for Applications and Department of Informatics, University of Oslo, P.O. Box 1053 Blindern, 0316 Oslo, Norway, e-mail: `ragnar.winther@cma.uio.no`

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It has been observed by M. Olshanskii and A. Reusken that there is a gap in the proof of Lemma 1 of our paper [2]. The bound (4) should not be applied directly to the operator $\mathbf{grad}^{-1}$, but to an operator of the form $T = \mathbf{grad}^{-1} \circ \boldsymbol{P}$ mapping the entire space $\boldsymbol{H}^{-1}$ onto L^2_0. It is required that the operator $\boldsymbol{P}$ maps $\boldsymbol{H}^{-1}$ onto the space $\boldsymbol{G}_0 = \mathbf{grad}(L^2_0)$, is invariant on $\boldsymbol{G}_0$, and bounded in $\boldsymbol{H}^{-1}$ and $\boldsymbol{L}^2$. The desired bound then follows by applying (4) to the identity $q = T\,\mathbf{grad}\,q$. The natural choice for $\boldsymbol{P}$ is the $\boldsymbol{H}^{-1}$ projection onto $\boldsymbol{G}_0$, defined from the linear Stokes system, which is $\boldsymbol{L}^2$ bounded if the polygonial domain Ω is convex, cf. [1]. Therefore, convexity of Ω should be stated as an assumption for Lemma 1 and the later discussion given in [2]. We refer to [3] for further details.

References

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3. M. Olshanskii, J. Peters, and A. Reusken, Uniform preconditioners for a parameter dependent saddle point problem with application to generalized Stokes interface equations, Preprint 2005.