

## A note on inexact inner product in GMRES

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The saddle formulation of the weakly-constrained 4DVar algorithm. However this approach may require to solve large saddle point systems with iterative solvers like GMRES to full accuracy in order to guarantee the global convergence of the 4DVar algorithm. In order to reduce computational running time, we describe how variable precision floating-point arithmetic can be used to compute inner products in the iterative solver GMRES. We show how the precision of the inner products carried out in the algorithm can be reduced as the iterations proceed, without affecting the convergence rate or final accuracy achieved by the iterates.

### References:

[1] S. Gratton, E. Simon, D. Titley-Peloquin, Ph. Toint. A note on inexact inner products in GMRES, SIAM J. Mat. Anal. Appl. , in press

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