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Yicong Ma  
**Preconditioned GMRES method with applications**

109 McAllister Building  
University Park  
State College  
PA 16802  
yxm147@psu.edu  
Kaibo Hu  
Xiaozhe Hu  
Jinchao Xu

Preconditioned GMRES method is widely used in solving linear systems in the coupled multi-physics problems. Block triangular preconditioners usually give satisfactory performance. We first analyze such preconditioned GMRES method for an abstract problem, and then apply this technique to linear systems arising from the finite element discretization.