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LOW-RANK UPDATE OF PRECONDITIONERS FOR THE INEXACT NEWTON METHOD WITH SPD JACOBIAN

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In this paper preconditioners for the Conjugate Gradient are studied to solve the Newton system with symmetric positive definite Jacobian. In particular, we define a sequence of preconditioners built by means of BFGS rank-two updates. Optimality conditions are derived which guarantee that the preconditioned matrices are not far from the identity in a matrix norm. Some notes on the implementation of the corresponding inexact Newton method are given and some numerical results on a model problem illustrate the application of the proposed preconditioners.