

**Meeting:** 1003, Atlanta, Georgia, SS 33A, AMS Special Session on Topics in Geometric Function Theory, I

1003-31-803      **John F Rossi\***, Department of Mathematics, Blacksburg, VA 24060. *Applications of Potential Theory to problems in numerical linear algebra.* Preliminary report.

If  $A$  is a very large matrix, solving  $Ax = b$  relies on indirect (iterative) methods such as GMRES. Convergence rates can be estimated by computing the logarithmic capacity of a domain containing the spectrum of  $A$ . We employ indirect methods using Arnoldi iteration and Krylov subspaces to find eigenspaces of  $A$  and to compute  $f(A)$  for  $f$  analytic. We relate the convergence rates of these methods to notions of capacity. (Received September 29, 2004)