Ginzburg-Landau (1-dimensional) solved by SCALCG

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In this work I present the results of SCALCG package for solving the Optimal Design with Composite Materials problem from MINPACK-2 Collection. In this experiments I have considered:

$$n = 1000, \qquad t = 5, \qquad \theta^s = .true. \text{ (spectral)}$$

I considered the following stopping criteria:

Stopping criterion	Algebraic expression
1	$\|\nabla f(x_k)\|_\infty \le \varepsilon_g$ or $\|\alpha_k \nabla f(x_k)^T d_k\| \le \varepsilon_f \|f(x_{k+1})\|$
2	$\|\nabla f(x_k)\|_\infty \le \max\{\varepsilon_g, \varepsilon_f \|\nabla f(x_0)\|_\infty\}$
3	$\|\nabla f(x_k)\|_2 \le \varepsilon_g$
4	$\|\nabla f(x_k)\|_2 \le \varepsilon_g \max\{1, \|f(x_{k+1})\|\}$

where

$$\varepsilon_f = 10^{-20} \text{ and } \varepsilon_g = 10^{-6}.$$

The results are as follows:

```
 Ginzburg-Landau (1-dimensional) Problem   December 6, 2006, *** SCALCG Package ***
Powell criterion for restart.   Stoptest = 1
     n   iter    irs   fgcnt  lscnt   time(c)       fxnew                gnorm
-------------------------------------------------------------------------------------
theta spectral
  1000  10001   4448   13113   3111   18856  -.2000321264091E-03   .1433005520331E-01
-------------------------------------------------------------------------------------
TOTAL   10001   4448   13113   3111  188.56(seconds)     proc= 44.48%


SCALCG: istop (f)  total =      0    istop (g)  total =      0
        istop (fg) total =      0    istop (fr) total =      0


 Ginzburg-Landau (1-dimensional) Problem   December 6, 2006, *** SCALCG Package ***
Powell criterion for restart.   Stoptest = 2
     n   iter    irs   fgcnt  lscnt   time(c)       fxnew                gnorm
-------------------------------------------------------------------------------------
theta spectral
  1000  10001   4448   13113   3111   18856  -.2000321264091E-03   .1433005520331E-01
-------------------------------------------------------------------------------------
TOTAL   10001   4448   13113   3111  188.56(seconds)     proc= 44.48%


 Ginzburg-Landau (1-dimensional) Problem   December 6, 2006, *** SCALCG Package ***
Powell criterion for restart.   Stoptest = 3
     n   iter    irs   fgcnt  lscnt   time(c)       fxnew                gnorm
-------------------------------------------------------------------------------------
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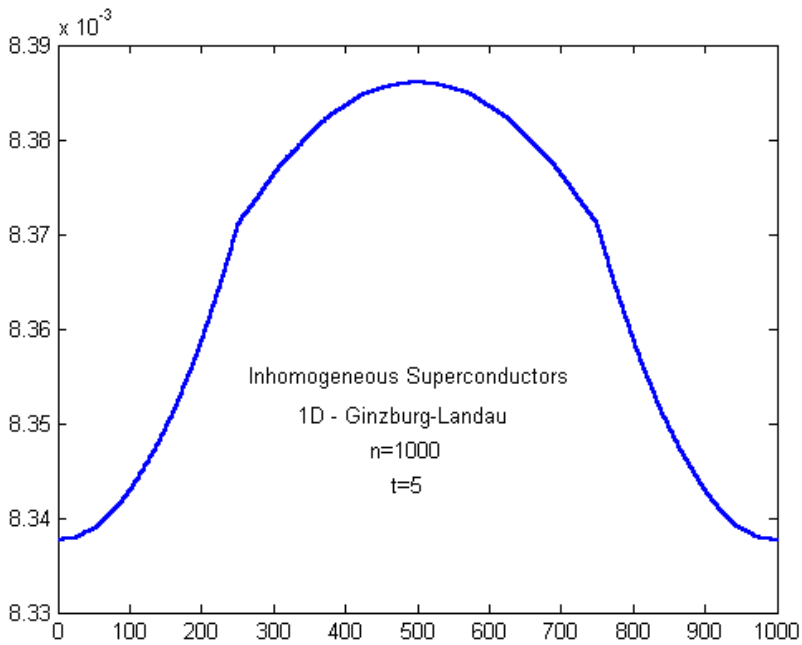
```
theta spectral
  1000  10001   4448   13113   3111   18850  -.2000321264091E-03   .1433005520331E-01
-----------------------------------------------------------------------------------------
TOTAL   10001   4448   13113   3111  188.50(seconds)     proc= 44.48%


 Ginzburg-Landau (1-dimensional) Problem   December 6, 2006, *** SCALCG Package ***
Powell criterion for restart.   Stoptest = 4
     n   iter    irs   fgcnt  lscnt   time(c)       fxnew                gnorm
-----------------------------------------------------------------------------------------
theta spectral
  1000  10001   4448   13113   3111   18856  -.2000321264091E-03   .1433005520331E-01
-----------------------------------------------------------------------------------------
TOTAL   10001   4448   13113   3111  188.56(seconds)     proc= 44.48%
```



December 6, 2006