Table of Contents

addpath for PQN working

```
%addpath(genpath('/Volumes/Users/linamiao/Dropbox/PQN/'))
cd ../../../../pqnl1;
addpath(genpath(pwd))
cd ../experiments/help_spgl1/modifying/task12illconditioned
rmpath('/Volumes/Users/linamiao/Dropbox/PQN/pqnl1/minConF/')
%stream = RandStream.getGlobalStream;
%reset(stream);
```

sample matrix and options

```
i = 1;
for m = [ 200 250 300 350 400 450 500]

    %m = 200;
    n = 512; k = 20; % m rows, n cols, k nonzeros.
    A  = randn(m,n); [Q,R] = qr(A',0);  A = Q';
    [u s v] = svd(A);

    %figure;plot(diag(s));title('singular values of A')
    ns = length(diag(s));
    nn = linspace(0,1,ns);
    s_ill = exp(-nn.^.1);
    s_ill = s_ill - (1-1e-6)*min(s_ill);
    condition_number = max(s_ill)/min(s_ill)

    s_new = zeros(m,n);
    s_new(1:min(m,n),1:min(m,n)) = diag(s_ill);


    %figure;plot(diag(s_new));title('proposed singular values')
    A_ill = u'*s_new*v;

    opts.iterations = 100;
    %opts.verbosity = 0;

    % save temp A m n k opts
    % clear;
    % load temp


        condition_number =
```

```
   1.7183e+06
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condition_number =

   1.7183e+06
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condition_number =

   1.7183e+06
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condition_number =

   1.7183e+06
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condition_number =

   1.7183e+06
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problem setting

```
p = randperm(n); x0 = zeros(n,1); x0(p(1:k)) = sign(randn(k,1));
%figure;plot(x0)
b  = A_ill*x0;

tau = norm(x0,1);
```

Lasso

```
[x_spg,r_spg,g_spg,info_spg] = spgl1(A_ill, b, tau, [], zeros(size(x0)), opts)
[x_pqn,r_pqn,g_pqn,info_pqn] = pqnl1_2(A_ill, b, tau, [], zeros(size(x0)), opt

figure(i);
subplot(2,1,1); plot(x_spg);title('x_spg')
```

```
subplot(2,1,2); plot(x_pqn);title('x_pqn')

i = i + 1;
```

```
================================================================================
SPGL1_SLIM v. 46  (Tue, 14 Jun 2011) based on v.1017
================================================================================
No. rows              :      200      No. columns           :      512
Initial tau           : 2.00e+01      Two-norm of b         : 2.80e-01
Optimality tol        : 1.00e-04      Target one-norm of x  : 2.00e+01
Basis pursuit tol     : 1.00e-06      Maximum iterations    :      100

 Iter      Objective   Relative Gap      gNorm   stepG    nnzX    nnzG
    0  2.7991588e-01  6.9631704e-01   3.48e-02     0.0       0       0
    1  1.6832048e-01  3.2669672e-01   1.44e-02    -0.3     167       0
    2  1.3186378e-01  1.2778997e-01   6.90e-03     0.0     460       0
    3  1.2066610e-01  2.7503831e-02   1.43e-03     0.0     445       0
    4  1.1744469e-01  2.6124197e-02   1.39e-03     0.0     467       0
    5  7.5502809e-02  1.7654333e-02   8.79e-04     0.0     504       0
    6  9.4119667e-02  1.7222790e-01   9.32e-03    -0.3     497       0
    7  7.2242081e-02  9.7089618e-02   4.51e-03    -0.3     504       0
    8  6.4057749e-02  8.9743424e-03   5.56e-04     0.0     498       0
    9  6.3560388e-02  8.9836530e-03   5.54e-04     0.0     499       0
   10  5.3327297e-02  6.0431385e-02   3.40e-03     0.0     433       0
   11  5.0301520e-02  4.1962317e-02   2.02e-03    -0.3     454       0
   12  4.7803099e-02  1.3717645e-02   8.70e-04     0.0     449       0
   13  4.7078455e-02  6.3353895e-03   4.25e-04     0.0     452       0
   14  4.6765365e-02  5.8167060e-03   4.11e-04     0.0     451       0
   15  4.4727564e-02  6.3465199e-03   3.86e-04     0.0     447       0
   16  4.5920256e-02  3.1620580e-02   1.84e-03    -0.3     451       0
   17  4.4447272e-02  1.6776471e-02   8.61e-04     0.0     441       0
   18  4.3829285e-02  4.7839190e-03   3.48e-04     0.0     440       0
   19  4.3721144e-02  4.8583890e-03   3.48e-04     0.0     438       0
   20  3.9608842e-02  6.0795244e-03   4.28e-04     0.0     379       0
   21  4.1574334e-02  3.9630153e-02   1.89e-03    -0.3     388       0
   22  4.0843855e-02  2.7903822e-02   1.62e-03     0.0     417       0
   23  3.9000253e-02  3.9809995e-03   2.86e-04     0.0     383       0
   24  3.8930166e-02  3.8596031e-03   2.84e-04     0.0     382       0
   25  3.7633757e-02  9.0633669e-03   5.96e-04     0.0     364       0
   26  3.8259407e-02  2.2358933e-02   1.11e-03    -0.3     370       0
   27  3.7432564e-02  6.6878906e-03   4.67e-04     0.0     364       0
   28  3.7212847e-02  3.6436270e-03   2.72e-04     0.0     362       0
   29  3.7155207e-02  3.5427600e-03   2.70e-04     0.0     361       0
   30  3.5589964e-02  9.7698033e-03   6.29e-04     0.0     339       0
   31  3.5752546e-02  1.4122574e-02   7.27e-04    -0.3     348       0
   32  3.5343887e-02  4.9856462e-03   3.69e-04     0.0     340       0
   33  3.5198032e-02  3.0690255e-03   2.41e-04     0.0     340       0
   34  3.5148706e-02  2.9552402e-03   2.38e-04     0.0     339       0
   35  3.4203920e-02  3.1768437e-03   2.36e-04     0.0     326       0
   36  3.4299870e-02  1.2105544e-02   7.55e-04    -0.3     329       0
   37  3.4197557e-02  1.1464761e-02   6.04e-04    -0.3     331       0
   38  3.3827034e-02  2.3744314e-03   2.17e-04     0.0     326       0
   39  3.3768898e-02  2.7308958e-03   2.23e-04     0.0     325       0
```

40	3.3684242e-02	2.6729073e-03	2.21e-04	0.0	325	0
41	2.8272695e-02	2.2474262e-02	1.30e-03	0.0	245	0
42	2.7686082e-02	1.5676005e-02	7.81e-04	-0.3	272	0
43	2.8408241e-02	2.1294421e-02	1.24e-03	0.0	280	0
44	2.6930235e-02	1.7908189e-03	1.56e-04	0.0	261	0
45	2.6896107e-02	1.8060503e-03	1.61e-04	0.0	259	0
46	2.6769645e-02	1.8319292e-03	1.68e-04	0.0	254	0
47	2.6699013e-02	2.7585790e-03	1.89e-04	-0.3	253	0
48	2.6793152e-02	7.5382082e-03	4.86e-04	-0.3	253	0
49	2.6581599e-02	1.7651696e-03	1.51e-04	0.0	252	0
50	2.6550898e-02	1.7864021e-03	1.60e-04	0.0	252	0
51	2.6507479e-02	1.7869657e-03	1.61e-04	0.0	252	0
52	2.6225894e-02	2.6444749e-02	1.27e-03	0.0	234	0
53	2.4721855e-02	1.8260120e-03	1.71e-04	-0.3	261	0
54	2.4588064e-02	1.3510917e-03	1.30e-04	0.0	253	0
55	2.4507257e-02	1.3248463e-03	1.34e-04	0.0	252	0
56	2.4226171e-02	1.7538731e-03	1.39e-04	0.0	239	0
57	2.4248113e-02	4.3860370e-03	3.10e-04	-0.3	244	0
58	2.4160463e-02	1.3880610e-03	1.25e-04	0.0	238	0
59	2.4128056e-02	1.4244996e-03	1.38e-04	0.0	238	0
60	2.4107722e-02	1.4162214e-03	1.36e-04	0.0	238	0
61	2.3724075e-02	4.8119384e-03	3.30e-04	0.0	228	0
62	2.3678989e-02	2.7832817e-03	1.84e-04	-0.3	229	0
63	2.3618624e-02	1.4956827e-03	1.49e-04	0.0	229	0
64	2.3584682e-02	1.2970761e-03	1.28e-04	0.0	229	0
65	2.3568766e-02	1.3024708e-03	1.29e-04	0.0	229	0
66	2.3134211e-02	1.2672422e-03	1.31e-04	0.0	225	0
67	2.3264162e-02	9.6944507e-03	4.99e-04	-0.3	225	0
68	2.2999270e-02	1.1752851e-03	1.26e-04	-0.3	225	0
69	2.2960421e-02	1.1523127e-03	1.15e-04	0.0	225	0
70	2.2928684e-02	1.1721663e-03	1.19e-04	0.0	225	0
71	2.2795819e-02	2.0966081e-03	1.80e-04	0.0	223	0
72	2.2849049e-02	4.9698915e-03	2.82e-04	-0.3	222	0
73	2.2831963e-02	4.2476584e-03	2.98e-04	0.0	224	0
74	2.2715071e-02	1.1795521e-03	1.16e-04	0.0	223	0
75	2.2700191e-02	1.1919394e-03	1.20e-04	0.0	222	0
76	2.2662347e-02	1.2005804e-03	1.23e-04	0.0	222	0
77	2.2178601e-02	8.2084302e-03	4.29e-04	0.0	211	0
78	2.2079891e-02	3.6594178e-03	2.64e-04	-0.3	213	0
79	2.1955175e-02	1.1426356e-03	1.08e-04	0.0	212	0
80	2.1932342e-02	1.1406567e-03	1.14e-04	0.0	212	0
81	2.1909405e-02	1.1443882e-03	1.15e-04	0.0	213	0
82	2.1790641e-02	5.1698714e-03	3.45e-04	-0.3	211	0
83	2.1815953e-02	5.4831648e-03	3.04e-04	-0.3	212	0
84	2.1709401e-02	2.6455473e-03	2.07e-04	0.0	211	0
85	2.1643561e-02	1.1248556e-03	1.12e-04	0.0	212	0
86	2.1629279e-02	1.1331385e-03	1.15e-04	0.0	211	0
87	2.1541039e-02	1.1279189e-03	1.12e-04	0.0	211	0
88	2.1584158e-02	9.9591354e-03	6.05e-04	-0.3	211	0
89	2.1385353e-02	5.5858626e-03	3.08e-04	-0.3	217	0
90	2.1253942e-02	3.0109351e-03	2.26e-04	0.0	213	0
91	2.1180406e-02	1.0460014e-03	1.09e-04	0.0	213	0
92	2.1164020e-02	1.0547257e-03	1.11e-04	0.0	213	0
93	2.1076482e-02	1.0705288e-03	1.11e-04	0.0	210	0

```
   94  1.9980475e-02  2.0959260e-02   1.00e-03     0.0     170       0
   95  1.9080436e-02  7.0806154e-03   4.40e-04    -0.3     205       0
   96  1.8927087e-02  6.8178552e-03   3.55e-04     0.0     181       0
   97  1.8707964e-02  8.6878060e-04   9.28e-05     0.0     190       0
   98  1.8686488e-02  8.5387313e-04   8.87e-05     0.0     186       0
   99  1.8622137e-02  8.2535168e-04   8.60e-05     0.0     186       0
  100  1.8665382e-02  4.8779839e-03   3.18e-04    -0.3     186       0
NOTE: solution not actually optimal, best objective value is 1.8622137e-02
 ERROR EXIT -- Too many iterations

 Products with A     :     149        Total time   (secs) :     0.3
 Products with A'    :     101        Project time (secs) :     0.1
 Newton iterations   :       0        Mat-vec time (secs) :     0.1
 Line search its     :     110        Subspace iterations :       0

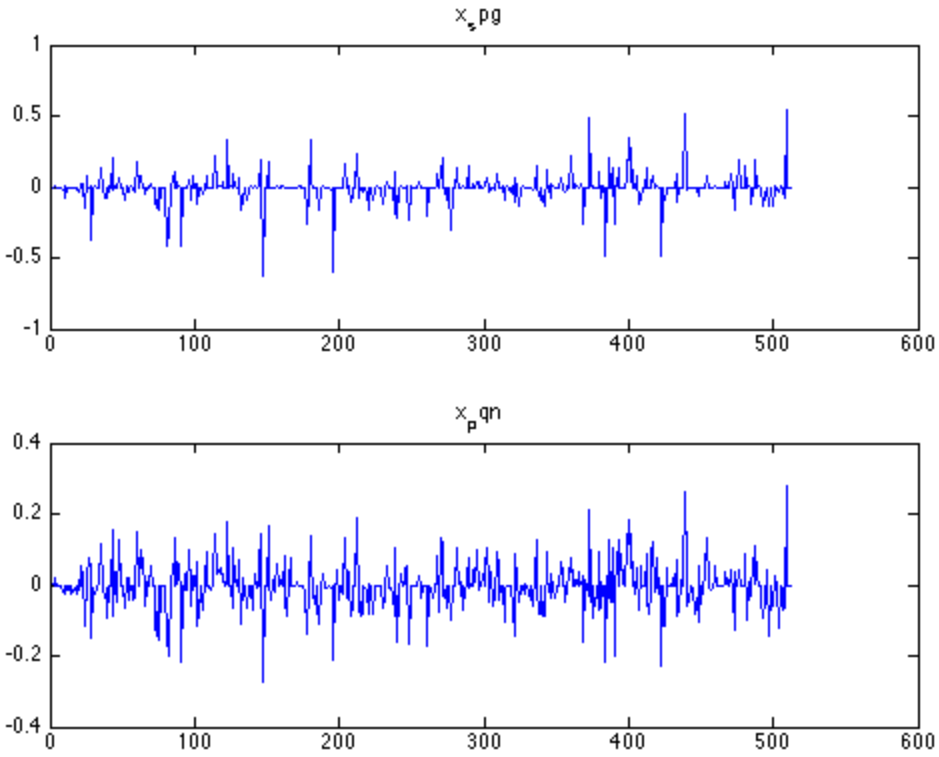

 ================================================================================
 PQNL1_SLIM v. 46  (Tue, 14 Jun 2011) based on v.1017
 ================================================================================
 No. rows              :      200      No. columns           :      512
 Initial tau           : 2.00e+01      Two-norm of b         : 2.80e-01
 Optimality tol        : 1.00e-04      Target one-norm of x  : 2.00e+01
 Basis pursuit tol     : 1.00e-06      Maximum iterations    :      100

  Iter      Objective   Relative Gap      gNorm   stepG    nnzX    nnzG
     0  2.7991588e-01  6.9631704e-01   3.48e-02     0.0       0       0
Inside of minConf_PQN
 Iteration   FunEvals Projections     Step Length          rNorm2        O
         1          1           4     1.00000e+00     1.98049e-01     1.648
         2          1          13     1.00000e+00     1.26340e-01     2.309
         3          1          22     1.00000e+00     1.23169e-01     2.281
         4          1          50     1.00000e+00     8.07593e-02     2.603
         5          1          84     1.00000e+00     6.66264e-02     1.350
         6          1         123     1.00000e+00     5.57931e-02     7.052
         7          1         157     1.00000e+00     5.27616e-02     8.679
         8          1         182     1.00000e+00     4.94992e-02     5.934
         9          1         206     1.00000e+00     4.53987e-02     3.292
        10          1         228     1.00000e+00     4.37354e-02     2.874
        11          1         262     1.00000e+00     4.14156e-02     3.311
        12          1         298     1.00000e+00     3.97923e-02     2.199
        13          1         307     1.00000e+00     3.94577e-02     4.824
        14          1         327     1.00000e+00     3.87650e-02     2.289
        15          1         341     1.00000e+00     3.84693e-02     1.635
        16          1         357     1.00000e+00     3.79128e-02     1.858
        17          1         375     1.00000e+00     3.74551e-02     1.917
        18          1         403     1.00000e+00     3.59661e-02     1.311
        19          1         408     1.00000e+00     3.59464e-02     1.220
        20          1         413     1.00000e+00     3.59287e-02     1.154
        21          1         418     1.00000e+00     3.59121e-02     1.106
        22          1         423     1.00000e+00     3.58963e-02     1.089
        23          1         428     1.00000e+00     3.58809e-02     1.080
        24          1         433     1.00000e+00     3.58655e-02     1.058
        25          1         438     1.00000e+00     3.58505e-02     1.049
        26          1         443     1.00000e+00     3.58355e-02     1.034
```

27	1	448	1.00000e+00	3.58208e-02	1.021
28	1	453	1.00000e+00	3.58062e-02	1.013
29	1	458	1.00000e+00	3.57918e-02	1.010
30	1	463	1.00000e+00	3.57774e-02	1.001
31	1	468	1.00000e+00	3.57631e-02	9.986
32	1	473	1.00000e+00	3.57489e-02	9.976
33	1	478	1.00000e+00	3.57347e-02	9.925
34	1	483	1.00000e+00	3.57206e-02	9.908
35	1	488	1.00000e+00	3.57065e-02	9.886
36	1	493	1.00000e+00	3.56924e-02	9.850
37	1	498	1.00000e+00	3.56785e-02	9.820
38	1	503	1.00000e+00	3.56645e-02	9.799
39	1	508	1.00000e+00	3.56506e-02	9.780
40	1	513	1.00000e+00	3.56367e-02	9.740
41	1	518	1.00000e+00	3.56229e-02	9.732
42	1	523	1.00000e+00	3.56090e-02	9.727
43	1	528	1.00000e+00	3.55952e-02	9.672
44	1	533	1.00000e+00	3.55815e-02	9.659
45	1	538	1.00000e+00	3.55677e-02	9.654
46	1	543	1.00000e+00	3.55540e-02	9.641
47	1	548	1.00000e+00	3.55403e-02	9.610
48	1	553	1.00000e+00	3.55267e-02	9.601
49	1	558	1.00000e+00	3.55130e-02	9.596
50	1	563	1.00000e+00	3.54994e-02	9.590
51	1	568	1.00000e+00	3.54858e-02	9.585
52	1	573	1.00000e+00	3.54722e-02	9.578
53	1	578	1.00000e+00	3.54586e-02	9.570
54	1	583	1.00000e+00	3.54450e-02	9.565
55	1	588	1.00000e+00	3.54314e-02	9.559
56	1	593	1.00000e+00	3.54179e-02	9.553
57	1	598	1.00000e+00	3.54043e-02	9.547
58	1	603	1.00000e+00	3.53908e-02	9.542
59	1	608	1.00000e+00	3.53773e-02	9.536
60	1	613	1.00000e+00	3.53638e-02	9.530
61	1	618	1.00000e+00	3.53503e-02	9.524
62	1	623	1.00000e+00	3.53368e-02	9.489
63	1	628	1.00000e+00	3.53234e-02	9.461
64	1	633	1.00000e+00	3.53100e-02	9.437
65	1	638	1.00000e+00	3.52967e-02	9.425
66	1	643	1.00000e+00	3.52834e-02	9.419
67	1	648	1.00000e+00	3.52701e-02	9.414
68	1	653	1.00000e+00	3.52568e-02	9.408
69	1	658	1.00000e+00	3.52436e-02	9.403
70	1	663	1.00000e+00	3.52303e-02	9.397
71	1	668	1.00000e+00	3.52171e-02	9.391
72	1	673	1.00000e+00	3.52038e-02	9.373
73	1	678	1.00000e+00	3.51906e-02	9.348
74	1	683	1.00000e+00	3.51775e-02	9.342
75	1	688	1.00000e+00	3.51643e-02	9.286
76	1	693	1.00000e+00	3.51513e-02	9.266
77	1	698	1.00000e+00	3.51384e-02	9.214
78	1	703	1.00000e+00	3.51255e-02	9.199
79	1	708	1.00000e+00	3.51128e-02	9.192
80	1	713	1.00000e+00	3.51000e-02	9.186

```
        81          1        718     1.00000e+00     3.50872e-02     9.181
        82          1        723     1.00000e+00     3.50745e-02     9.175
        83          1        728     1.00000e+00     3.50617e-02     9.169
        84          1        733     1.00000e+00     3.50490e-02     9.164
        85          1        738     1.00000e+00     3.50362e-02     9.150
        86          1        743     1.00000e+00     3.50235e-02     9.137
        87          1        748     1.00000e+00     3.50108e-02     9.131
        88          1        753     1.00000e+00     3.49982e-02     9.126
        89          1        758     1.00000e+00     3.49855e-02     9.100
        90          1        763     1.00000e+00     3.49729e-02     9.090
        91          1        768     1.00000e+00     3.49602e-02     9.064
        92          1        773     1.00000e+00     3.49476e-02     9.058
        93          1        778     1.00000e+00     3.49351e-02     9.053
        94          1        783     1.00000e+00     3.49225e-02     9.047
        95          1        788     1.00000e+00     3.49099e-02     9.042
        96          1        793     1.00000e+00     3.48974e-02     9.037
        97          1        798     1.00000e+00     3.48848e-02     9.031
        98          1        803     1.00000e+00     3.48723e-02     9.021
        99          1        808     1.00000e+00     3.48598e-02     8.999
       100          1        813     1.00000e+00     3.48473e-02     8.983
  100  3.4847305e-02  2.7803111e-03   2.28e-04     0.0     331       0
ERROR EXIT -- Too many iterations

Products with A     :     102        Total time   (secs) :     1.5
Products with A'    :     102        Project time (secs) :     1.1
Newton iterations   :       0        Mat-vec time (secs) :     0.0
```




```
================================================================================
SPGL1_SLIM v. 46  (Tue, 14 Jun 2011) based on v.1017
================================================================================
No. rows              :      250      No. columns           :      512
Initial tau           : 2.00e+01      Two-norm of b         : 1.99e-01
Optimality tol        : 1.00e-04      Target one-norm of x  : 2.00e+01
Basis pursuit tol     : 1.00e-06      Maximum iterations    :      100

 Iter      Objective   Relative Gap      gNorm   stepG    nnzX    nnzG
    0  1.9865793e-01  6.0782537e-01  3.04e-02     0.0       0       0
    1  1.6010542e-01  4.3398885e-01  2.05e-02    -0.3     226       0
    2  1.2414215e-01  8.2643230e-02  4.32e-03     0.0     451       0
    3  1.1974406e-01  3.0937422e-02  1.59e-03     0.0     443       0
    4  1.1646372e-01  2.9135592e-02  1.53e-03     0.0     446       0
    5  8.0235863e-02  4.2153370e-02  2.06e-03     0.0     499       0
    6  9.6128660e-02  2.4472695e-01  1.26e-02    -0.3     500       0
    7  9.0021703e-02  2.3188853e-01  1.11e-02     0.0     500       0
    8  7.1215825e-02  9.1331946e-03  5.50e-04     0.0     498       0
    9  7.0708855e-02  8.8182362e-03  5.32e-04     0.0     500       0
   10  5.6055190e-02  8.2871377e-03  5.32e-04     0.0     498       0
   11  6.6181948e-02  9.4201413e-02  4.52e-03     0.0     422       0
   12  6.7603965e-02  1.4256462e-01  7.38e-03    -0.3     479       0
   13  5.6040620e-02  4.3633531e-02  2.15e-03     0.0     490       0
   14  5.3804340e-02  1.1914048e-02  6.64e-04     0.0     493       0
   15  5.2316285e-02  1.0679383e-02  6.04e-04     0.0     492       0
```

16	4.7755522e-02	1.5016072e-02	8.96e-04	0.0	476	0
17	5.1050513e-02	8.0873474e-02	3.99e-03	-0.3	463	0
18	4.7268454e-02	1.9169892e-02	1.11e-03	0.0	475	0
19	4.6864123e-02	4.4361926e-03	3.33e-04	0.0	470	0
20	4.6773454e-02	4.4278193e-03	3.33e-04	0.0	466	0
21	4.2230574e-02	5.7406915e-02	3.06e-03	0.0	315	0
22	4.1534696e-02	4.8124856e-02	2.40e-03	-0.3	345	0
23	4.0520045e-02	3.4354876e-02	1.87e-03	0.0	378	0
24	3.9365440e-02	3.5973122e-03	2.68e-04	0.0	347	0
25	3.9273212e-02	3.5610169e-03	2.70e-04	0.0	350	0
26	3.8517507e-02	3.1458868e-03	2.52e-04	0.0	354	0
27	3.8717326e-02	3.4540540e-02	1.75e-03	-0.3	336	0
28	3.7764357e-02	4.2700347e-03	3.14e-04	-0.3	350	0
29	3.7666523e-02	2.8390846e-03	2.29e-04	0.0	344	0
30	3.7602671e-02	2.7713752e-03	2.27e-04	0.0	344	0
31	3.6196660e-02	2.3312007e-02	1.30e-03	0.0	303	0
32	3.6298026e-02	2.4537277e-02	1.26e-03	-0.3	329	0
33	3.5771995e-02	1.0074053e-02	6.13e-04	0.0	302	0
34	3.5611791e-02	2.2778877e-03	2.01e-04	0.0	304	0
35	3.5574387e-02	2.2135817e-03	1.99e-04	0.0	301	0
36	3.4870825e-02	3.1629762e-03	2.34e-04	0.0	291	0
37	3.5039276e-02	1.7304871e-02	9.86e-04	-0.3	293	0
38	3.5003261e-02	1.6451586e-02	8.74e-04	0.0	292	0
39	3.4673117e-02	2.0320539e-03	1.93e-04	0.0	288	0
40	3.4634838e-02	2.2011544e-03	1.96e-04	0.0	288	0
41	3.4566607e-02	2.1560286e-03	1.94e-04	0.0	288	0
42	2.9673427e-02	2.3181300e-02	1.18e-03	0.0	225	0
43	3.2711344e-02	5.5095771e-02	2.93e-03	-0.3	263	0
44	3.1163038e-02	4.1015472e-02	2.04e-03	0.0	298	0
45	2.9325260e-02	1.4795066e-03	1.52e-04	0.0	253	0
46	2.9225569e-02	1.6040833e-03	1.55e-04	0.0	258	0
47	2.8837366e-02	4.9645179e-03	3.32e-04	0.0	242	0
48	2.9102965e-02	1.6938026e-02	8.85e-04	-0.3	244	0
49	2.9004307e-02	1.4025573e-02	8.03e-04	0.0	244	0
50	2.8710463e-02	1.5964296e-03	1.50e-04	0.0	243	0
51	2.8688636e-02	1.4477326e-03	1.45e-04	0.0	243	0
52	2.8599459e-02	1.3384866e-03	1.41e-04	0.0	241	0
53	2.7953400e-02	3.7329887e-02	1.86e-03	0.0	211	0
54	2.6801846e-02	1.0783252e-02	6.32e-04	-0.3	250	0
55	2.6538169e-02	5.1415728e-03	3.14e-04	0.0	228	0
56	2.6462648e-02	1.2656866e-03	1.33e-04	0.0	234	0
57	2.6428551e-02	1.3362883e-03	1.33e-04	0.0	230	0
58	2.6298676e-02	1.1722957e-03	1.30e-04	0.0	230	0
59	2.6254836e-02	4.7498914e-03	2.94e-04	-0.3	226	0
60	2.6257925e-02	6.0868098e-03	3.86e-04	-0.3	233	0
61	2.6176752e-02	1.4476693e-03	1.35e-04	0.0	229	0
62	2.6151203e-02	1.1377014e-03	1.25e-04	0.0	229	0
63	2.6129893e-02	1.1473861e-03	1.24e-04	0.0	228	0
64	2.5743371e-02	2.1400050e-02	1.18e-03	0.0	209	0
65	2.5417807e-02	1.0798427e-02	5.82e-04	-0.3	227	0
66	2.5240239e-02	7.1770353e-03	4.39e-04	0.0	214	0
67	2.5142699e-02	1.0867316e-03	1.20e-04	0.0	214	0
68	2.5122567e-02	9.6559832e-04	1.15e-04	0.0	214	0
69	2.4995211e-02	1.1242582e-03	1.19e-04	0.0	213	0

```
   70  2.5006139e-02  8.9366103e-03   5.30e-04    -0.3     213       0
   71  2.5070204e-02  1.0170240e-02   5.51e-04    -0.3     218       0
   72  2.4896263e-02  3.1663730e-03   2.31e-04     0.0     211       0
   73  2.4858210e-02  9.4082002e-04   1.11e-04     0.0     212       0
   74  2.4843056e-02  9.0695210e-04   1.10e-04     0.0     212       0
   75  2.4224000e-02  4.2864356e-03   2.87e-04     0.0     202       0
   76  2.4316367e-02  9.4811021e-03   5.17e-04    -0.3     203       0
   77  2.4334131e-02  9.9080472e-03   5.79e-04     0.0     206       0
   78  2.4150402e-02  1.0597928e-03   1.13e-04     0.0     204       0
   79  2.4134056e-02  8.8820261e-04   1.08e-04     0.0     205       0
   80  2.4108195e-02  8.5480737e-04   1.06e-04     0.0     205       0
   81  2.2580602e-02  1.2290284e-03   1.20e-04     0.0     179       0
   82  2.2827439e-02  1.3096290e-02   7.38e-04    -0.3     192       0
   83  2.2681603e-02  1.3578503e-02   7.10e-04    -0.3     207       0
   84  2.2473390e-02  9.5467361e-03   5.56e-04     0.0     197       0
   85  2.2250404e-02  1.5910057e-03   1.36e-04     0.0     200       0
   86  2.2204113e-02  1.6771263e-03   1.43e-04     0.0     203       0
   87  2.2000282e-02  1.1558666e-03   1.15e-04     0.0     216       0
   88  2.1916782e-02  9.8633192e-03   5.72e-04     0.0     211       0
   89  2.1770531e-02  7.9892088e-04   9.60e-05    -0.3     211       0
   90  2.1743863e-02  7.2547235e-04   9.71e-05     0.0     210       0
   91  2.1721759e-02  6.8570221e-04   9.26e-05     0.0     208       0
   92  2.1642060e-02  1.4186172e-03   1.33e-04     0.0     201       0
   93  2.1677532e-02  6.6689327e-03   3.76e-04    -0.3     201       0
   94  2.1623301e-02  3.6398062e-03   2.48e-04    -0.3     198       0
   95  2.1573522e-02  7.2433043e-04   9.17e-05     0.0     199       0
   96  2.1562870e-02  6.2689595e-04   8.83e-05     0.0     199       0
   97  2.1525312e-02  6.7508135e-04   9.23e-05     0.0     195       0
   98  2.1470366e-02  8.8603477e-03   4.80e-04    -0.3     184       0
   99  2.1381157e-02  3.8658063e-03   2.59e-04    -0.3     183       0
  100  2.1321742e-02  8.7880339e-04   9.73e-05     0.0     183       0

 ERROR EXIT -- Too many iterations

 Products with A     :     145        Total time   (secs) :     0.3
 Products with A'    :     101        Project time (secs) :     0.1
 Newton iterations   :       0        Mat-vec time (secs) :     0.1
 Line search its     :      92        Subspace iterations :       0


 ================================================================================
 PQNL1_SLIM v. 46  (Tue, 14 Jun 2011) based on v.1017
 ================================================================================
 No. rows              :      250      No. columns           :      512
 Initial tau           : 2.00e+01      Two-norm of b         : 1.99e-01
 Optimality tol        : 1.00e-04      Target one-norm of x  : 2.00e+01
 Basis pursuit tol     : 1.00e-06      Maximum iterations    :      100

  Iter      Objective   Relative Gap      gNorm   stepG    nnzX    nnzG
     0  1.9865793e-01  6.0782537e-01   3.04e-02     0.0       0       0
Inside of minConf_PQN
 Iteration   FunEvals Projections     Step Length          rNorm2        O
         1          1           4     1.00000e+00     1.56837e-01     9.927
         2          1          13     1.00000e+00     1.23724e-01     1.941
```

3	1	24	1.00000e+00	1.21110e-01	1.956
4	1	72	1.00000e+00	8.99615e-02	2.804
5	1	105	1.00000e+00	7.69722e-02	1.741
6	1	142	1.00000e+00	6.55805e-02	8.303
7	1	168	1.00000e+00	6.20757e-02	9.886
8	1	193	1.00000e+00	5.75007e-02	8.083
9	1	227	1.00000e+00	5.18919e-02	7.761
10	1	259	1.00000e+00	4.80572e-02	8.910
11	1	277	1.00000e+00	4.70864e-02	5.917
12	1	305	1.00000e+00	4.59446e-02	2.186
13	1	326	1.00000e+00	4.52887e-02	2.285
14	1	338	1.00000e+00	4.48623e-02	2.338
15	1	363	1.00000e+00	4.37594e-02	2.243
16	1	432	1.00000e+00	3.90686e-02	1.532
17	1	437	1.00000e+00	3.90444e-02	1.475
18	1	442	1.00000e+00	3.90213e-02	1.443
19	1	447	1.00000e+00	3.89989e-02	1.397
20	1	452	1.00000e+00	3.89776e-02	1.376
21	1	457	1.00000e+00	3.89566e-02	1.348
22	1	462	1.00000e+00	3.89362e-02	1.327
23	1	467	1.00000e+00	3.89162e-02	1.305
24	1	472	1.00000e+00	3.88966e-02	1.296
25	1	477	1.00000e+00	3.88772e-02	1.286
26	1	482	1.00000e+00	3.88580e-02	1.274
27	1	487	1.00000e+00	3.88389e-02	1.269
28	1	492	1.00000e+00	3.88200e-02	1.256
29	1	497	1.00000e+00	3.88013e-02	1.251
30	1	502	1.00000e+00	3.87828e-02	1.240
31	1	507	1.00000e+00	3.87644e-02	1.226
32	1	512	1.00000e+00	3.87463e-02	1.219
33	1	517	1.00000e+00	3.87283e-02	1.210
34	1	522	1.00000e+00	3.87104e-02	1.203
35	1	527	1.00000e+00	3.86927e-02	1.187
36	1	532	1.00000e+00	3.86754e-02	1.180
37	1	537	1.00000e+00	3.86581e-02	1.176
38	1	542	1.00000e+00	3.86410e-02	1.172
39	1	547	1.00000e+00	3.86239e-02	1.164
40	1	552	1.00000e+00	3.86069e-02	1.158
41	1	557	1.00000e+00	3.85901e-02	1.155
42	1	562	1.00000e+00	3.85733e-02	1.151
43	1	567	1.00000e+00	3.85565e-02	1.148
44	1	572	1.00000e+00	3.85399e-02	1.144
45	1	577	1.00000e+00	3.85233e-02	1.131
46	1	582	1.00000e+00	3.85070e-02	1.120
47	1	587	1.00000e+00	3.84908e-02	1.115
48	1	592	1.00000e+00	3.84747e-02	1.105
49	1	597	1.00000e+00	3.84588e-02	1.097
50	1	602	1.00000e+00	3.84433e-02	1.082
51	1	607	1.00000e+00	3.84281e-02	1.075
52	1	612	1.00000e+00	3.84130e-02	1.069
53	1	617	1.00000e+00	3.83980e-02	1.056
54	1	622	1.00000e+00	3.83832e-02	1.048
55	1	627	1.00000e+00	3.83686e-02	1.046
56	1	632	1.00000e+00	3.83541e-02	1.044

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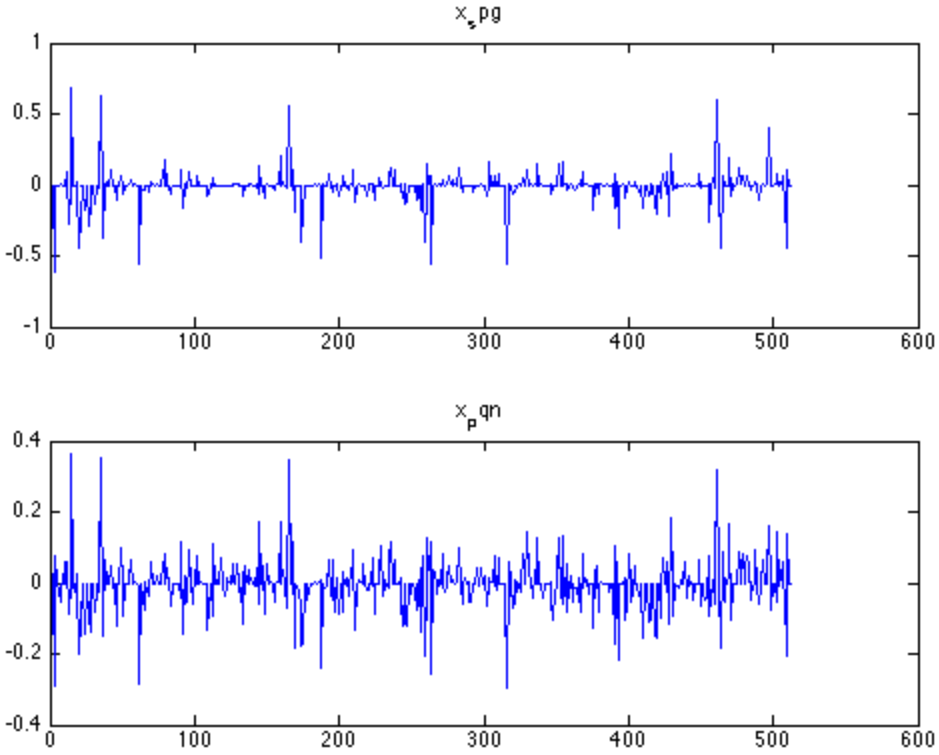
          57          1         637     1.00000e+00     3.83395e-02     1.043
          58          1         642     1.00000e+00     3.83250e-02     1.041
          59          1         647     1.00000e+00     3.83106e-02     1.039
          60          1         652     1.00000e+00     3.82962e-02     1.037
          61          1         657     1.00000e+00     3.82818e-02     1.030
          62          1         662     1.00000e+00     3.82675e-02     1.028
          63          1         667     1.00000e+00     3.82534e-02     1.014
          64          1         672     1.00000e+00     3.82396e-02     1.012
          65          1         677     1.00000e+00     3.82258e-02     1.004
          66          1         682     1.00000e+00     3.82123e-02     9.992
          67          1         687     1.00000e+00     3.81989e-02     9.959
          68          1         692     1.00000e+00     3.81855e-02     9.933
          69          1         697     1.00000e+00     3.81722e-02     9.871
          70          1         702     1.00000e+00     3.81590e-02     9.803
          71          1         707     1.00000e+00     3.81458e-02     9.749
          72          1         712     1.00000e+00     3.81328e-02     9.685
          73          1         717     1.00000e+00     3.81198e-02     9.620
          74          1         722     1.00000e+00     3.81069e-02     9.527
          75          1         727     1.00000e+00     3.80942e-02     9.434
          76          1         732     1.00000e+00     3.80817e-02     9.348
          77          1         737     1.00000e+00     3.80693e-02     9.307
          78          1         742     1.00000e+00     3.80570e-02     9.294
          79          1         747     1.00000e+00     3.80447e-02     9.282
          80          1         752     1.00000e+00     3.80325e-02     9.270
          81          1         757     1.00000e+00     3.80202e-02     9.235
          82          1         762     1.00000e+00     3.80081e-02     9.199
          83          1         767     1.00000e+00     3.79959e-02     9.177
          84          1         772     1.00000e+00     3.79839e-02     9.153
          85          1         777     1.00000e+00     3.79718e-02     9.142
          86          1         782     1.00000e+00     3.79598e-02     9.131
          87          1         787     1.00000e+00     3.79477e-02     9.120
          88          1         792     1.00000e+00     3.79357e-02     9.075
          89          1         797     1.00000e+00     3.79238e-02     9.042
          90          1         802     1.00000e+00     3.79120e-02     9.032
          91          1         807     1.00000e+00     3.79002e-02     9.022
          92          1         812     1.00000e+00     3.78883e-02     9.012
          93          1         817     1.00000e+00     3.78766e-02     9.002
          94          1         822     1.00000e+00     3.78648e-02     8.986
          95          1         827     1.00000e+00     3.78530e-02     8.952
          96          1         832     1.00000e+00     3.78413e-02     8.942
          97          1         837     1.00000e+00     3.78296e-02     8.932
          98          1         842     1.00000e+00     3.78179e-02     8.865
          99          1         847     1.00000e+00     3.78064e-02     8.838
         100          1         852     1.00000e+00     3.77949e-02     8.820
  100  3.7794850e-02  2.3522832e-03   2.04e-04     0.0     329       0
ERROR EXIT -- Too many iterations

Products with A     :     102        Total time   (secs) :     2.1
Products with A'    :     102        Project time (secs) :     1.5
Newton iterations   :       0        Mat-vec time (secs) :     0.1
```




```
================================================================================
SPGL1_SLIM v. 46  (Tue, 14 Jun 2011) based on v.1017
================================================================================
No. rows              :      300      No. columns           :      512
Initial tau           : 2.00e+01      Two-norm of b         : 2.54e-01
Optimality tol        : 1.00e-04      Target one-norm of x  : 2.00e+01
Basis pursuit tol     : 1.00e-06      Maximum iterations    :      100

 Iter      Objective   Relative Gap      gNorm   stepG    nnzX    nnzG
    0  2.5443181e-01  7.9842014e-01   3.99e-02     0.0       0       0
    1  1.8650125e-01  4.5271643e-01   2.14e-02    -0.3     254       0
    2  1.5909262e-01  5.2334939e-02   2.87e-03     0.0     437       0
    3  1.5318866e-01  4.7159312e-02   2.45e-03     0.0     464       0
    4  1.4355505e-01  4.1863104e-02   2.28e-03     0.0     477       0
    5  1.1287073e-01  2.2583044e-01   1.08e-02     0.0     499       0
    6  1.0932480e-01  1.7195989e-01   9.05e-03    -0.3     498       0
    7  9.8953530e-02  2.2349048e-02   1.23e-03     0.0     493       0
    8  9.7688432e-02  2.0136556e-02   1.15e-03     0.0     496       0
    9  8.6645022e-02  1.4207000e-02   8.90e-04     0.0     498       0
   10  8.3201768e-02  1.2814838e-01   6.86e-03    -0.3     483       0
   11  7.7124696e-02  2.8577278e-02   1.57e-03    -0.3     490       0
   12  7.6371419e-02  1.2222684e-02   8.25e-04     0.0     488       0
   13  7.5824514e-02  1.2009105e-02   8.10e-04     0.0     484       0
   14  6.4455109e-02  1.0167716e-01   5.49e-03     0.0     327       0
   15  6.7662663e-02  1.3798797e-01   6.79e-03    -0.3     358       0
```

16	6.5527250e-02	1.0100448e-01	5.48e-03	0.0	455	0
17	5.9805276e-02	6.4267517e-03	5.25e-04	0.0	393	0
18	5.9591397e-02	6.6991662e-03	5.44e-04	0.0	380	0
19	5.7753078e-02	2.2791607e-02	1.39e-03	0.0	325	0
20	5.8090700e-02	4.4402876e-02	2.31e-03	-0.3	336	0
21	5.7267795e-02	1.4290058e-02	9.51e-04	0.0	337	0
22	5.6909825e-02	5.7565983e-03	4.74e-04	0.0	328	0
23	5.6787201e-02	6.0215278e-03	4.93e-04	0.0	325	0
24	5.5024124e-02	6.5654307e-03	5.29e-04	0.0	304	0
25	5.6608525e-02	8.1557229e-02	4.07e-03	-0.3	304	0
26	5.3797644e-02	6.0876226e-03	5.05e-04	-0.3	357	0
27	5.3567519e-02	4.8846164e-03	4.21e-04	0.0	338	0
28	5.3317555e-02	5.0308542e-03	4.30e-04	0.0	325	0
29	5.1242524e-02	6.9510607e-02	3.78e-03	0.0	260	0
30	5.1442490e-02	7.2964187e-02	3.65e-03	-0.3	312	0
31	4.9878678e-02	4.2169813e-02	2.38e-03	0.0	356	0
32	4.8400197e-02	3.9032310e-03	3.59e-04	0.0	296	0
33	4.8294542e-02	4.1445034e-03	3.75e-04	0.0	290	0
34	4.7452472e-02	5.3242242e-03	4.49e-04	0.0	262	0
35	4.8022443e-02	4.2210316e-02	2.18e-03	-0.3	266	0
36	4.7262206e-02	1.2482207e-02	8.25e-04	-0.3	292	0
37	4.6948107e-02	3.4510891e-03	3.27e-04	0.0	272	0
38	4.6868418e-02	3.6875083e-03	3.44e-04	0.0	273	0
39	4.6281666e-02	9.1972688e-03	6.48e-04	0.0	262	0
40	4.6650628e-02	3.3195576e-02	1.74e-03	-0.3	265	0
41	4.6534768e-02	2.5121158e-02	1.48e-03	0.0	293	0
42	4.5868263e-02	3.2211325e-03	3.12e-04	0.0	269	0
43	4.5800043e-02	3.5940969e-03	3.38e-04	0.0	268	0
44	4.5566878e-02	3.8678790e-03	3.57e-04	0.0	265	0
45	4.5741212e-02	7.9631239e-02	3.95e-03	0.0	229	0
46	4.2469356e-02	2.6704969e-03	2.83e-04	-0.3	283	0
47	4.2328113e-02	2.5746537e-03	2.76e-04	0.0	276	0
48	4.2080656e-02	3.5363939e-02	2.00e-03	-0.3	232	0
49	4.1189859e-02	5.1778525e-03	3.92e-04	-0.3	248	0
50	4.1020479e-02	2.9849589e-03	3.04e-04	0.0	241	0
51	4.0926385e-02	2.5289202e-03	2.71e-04	0.0	240	0
52	4.0651089e-02	3.1588624e-03	3.14e-04	0.0	231	0
53	4.0531060e-02	1.0102273e-02	6.24e-04	-0.3	232	0
54	4.0486187e-02	8.3698616e-03	5.90e-04	-0.3	232	0
55	4.0326809e-02	2.1333702e-03	2.43e-04	0.0	230	0
56	4.0274034e-02	2.5031501e-03	2.69e-04	0.0	231	0
57	4.0148651e-02	2.5101780e-03	2.69e-04	0.0	230	0
58	3.2819812e-02	7.7654140e-02	4.13e-03	0.0	125	0
59	3.0012546e-02	5.5166373e-02	2.74e-03	-0.3	143	0
60	3.9785393e-02	1.1509570e-01	6.09e-03	0.0	268	0
61	2.7810366e-02	2.3998952e-02	1.25e-03	0.0	220	0
62	2.7183959e-02	4.3629737e-03	3.18e-04	0.0	204	0
63	2.7056886e-02	4.2259768e-03	3.12e-04	0.0	206	0
64	2.5726572e-02	9.4506873e-03	5.88e-04	0.0	190	0
65	2.6274548e-02	2.8269608e-02	1.44e-03	-0.3	199	0
66	2.6200848e-02	2.0705160e-02	1.18e-03	0.0	197	0
67	2.5442507e-02	2.4676026e-03	2.09e-04	0.0	192	0
68	2.5393806e-02	2.3553857e-03	2.08e-04	0.0	190	0
69	2.5253777e-02	2.1968138e-03	2.04e-04	0.0	185	0

```
   70  2.5248542e-02  2.7958629e-02   1.43e-03     0.0     172       0
   71  2.5298360e-02  2.0795465e-02   1.18e-03    -0.3     203       0
   72  2.4542477e-02  7.7458844e-03   4.61e-04     0.0     178       0
   73  2.4428788e-02  1.9308251e-03   1.86e-04     0.0     181       0
   74  2.4378059e-02  1.9230339e-03   1.85e-04     0.0     182       0
   75  2.4174715e-02  1.2171460e-02   7.30e-04    -0.3     177       0
   76  2.3958939e-02  3.4326629e-03   2.53e-04    -0.3     177       0
   77  2.3881267e-02  1.5638364e-03   1.73e-04     0.0     177       0
   78  2.3837870e-02  1.6797967e-03   1.71e-04     0.0     178       0
   79  2.3769349e-02  1.4840412e-03   1.69e-04     0.0     177       0
   80  2.3748581e-02  9.7873966e-03   5.56e-04     0.0     175       0
   81  2.3763067e-02  8.5111860e-03   5.39e-04    -0.3     174       0
   82  2.3582312e-02  1.6844202e-03   1.68e-04     0.0     175       0
   83  2.3548979e-02  1.5398368e-03   1.66e-04     0.0     175       0
   84  2.3508736e-02  1.4817027e-03   1.65e-04     0.0     175       0
   85  2.3014001e-02  7.1209967e-03   4.27e-04     0.0     166       0
   86  2.3005118e-02  5.4377085e-03   3.78e-04    -0.3     168       0
   87  2.2897866e-02  2.4132291e-03   2.01e-04     0.0     167       0
   88  2.2859052e-02  1.2982868e-03   1.54e-04     0.0     168       0
   89  2.2832081e-02  1.2823817e-03   1.53e-04     0.0     168       0
   90  2.0173165e-02  2.4034426e-02   1.23e-03     0.0     147       0
   91  2.1732717e-02  3.4842931e-02   1.91e-03    -0.3     182       0
   92  2.1022720e-02  3.1704766e-02   1.60e-03     0.0     177       0
   93  1.9731135e-02  1.1953195e-03   1.57e-04     0.0     159       0
   94  1.9641768e-02  1.0691116e-03   1.40e-04     0.0     157       0
   95  1.9578087e-02  9.9322838e-04   1.36e-04     0.0     156       0
   96  1.8992506e-02  7.6824731e-03   4.87e-04     0.0     151       0
   97  1.9364338e-02  1.8429064e-02   9.64e-04    -0.3     162       0
   98  1.9262696e-02  1.3005794e-02   7.67e-04     0.0     154       0
   99  1.8840901e-02  1.0880472e-03   1.32e-04     0.0     151       0
  100  1.8814256e-02  6.0946317e-04   1.12e-04     0.0     153       0

 ERROR EXIT -- Too many iterations

 Products with A     :     148        Total time   (secs) :     0.4
 Products with A'    :     101        Project time (secs) :     0.1
 Newton iterations   :       0        Mat-vec time (secs) :     0.1
 Line search its     :      91        Subspace iterations :       0


 ================================================================================
 PQNL1_SLIM v. 46  (Tue, 14 Jun 2011) based on v.1017
 ================================================================================
 No. rows              :      300      No. columns           :      512
 Initial tau           : 2.00e+01      Two-norm of b         : 2.54e-01
 Optimality tol        : 1.00e-04      Target one-norm of x  : 2.00e+01
 Basis pursuit tol     : 1.00e-06      Maximum iterations    :      100

  Iter      Objective   Relative Gap      gNorm   stepG    nnzX    nnzG
     0  2.5443181e-01  7.9842014e-01   3.99e-02     0.0       0       0
Inside of minConf_PQN
 Iteration   FunEvals Projections     Step Length          rNorm2        O
         1          1           4     1.00000e+00     2.02112e-01     1.304
         2          1          15     1.00000e+00     1.58756e-01     2.977
```

3	1	28	1.00000e+00	1.53984e-01	2.944
4	1	50	1.00000e+00	1.26687e-01	4.372
5	1	79	1.00000e+00	1.04913e-01	2.753
6	1	115	1.00000e+00	8.99940e-02	1.288
7	1	139	1.00000e+00	8.16906e-02	1.188
8	1	168	1.00000e+00	7.72762e-02	1.053
9	1	207	1.00000e+00	7.09099e-02	7.999
10	1	245	1.00000e+00	6.24719e-02	3.908
11	1	279	1.00000e+00	5.93954e-02	4.813
12	1	309	1.00000e+00	5.72013e-02	2.360
13	1	340	1.00000e+00	5.55685e-02	3.288
14	1	382	1.00000e+00	5.40718e-02	3.390
15	1	417	1.00000e+00	5.19193e-02	6.709
16	1	442	1.00000e+00	5.03454e-02	4.557
17	1	465	1.00000e+00	4.93499e-02	2.436
18	1	479	1.00000e+00	4.89912e-02	3.506
19	1	500	1.00000e+00	4.77791e-02	2.240
20	1	511	1.00000e+00	4.73626e-02	3.049
21	1	532	1.00000e+00	4.67184e-02	2.123
22	1	543	1.00000e+00	4.64346e-02	2.903
23	1	577	1.00000e+00	4.53856e-02	1.711
24	1	588	1.00000e+00	4.50851e-02	3.129
25	1	621	1.00000e+00	4.42320e-02	1.783
26	1	632	1.00000e+00	4.39343e-02	2.344
27	1	661	1.00000e+00	4.33669e-02	1.600
28	1	672	1.00000e+00	4.30965e-02	2.795
29	1	694	1.00000e+00	4.25325e-02	1.468
30	1	711	1.00000e+00	4.21123e-02	1.049
31	1	716	1.00000e+00	4.20918e-02	1.017
32	1	721	1.00000e+00	4.20723e-02	9.861
33	1	726	1.00000e+00	4.20537e-02	9.667
34	1	731	1.00000e+00	4.20354e-02	9.522
35	1	736	1.00000e+00	4.20175e-02	9.364
36	1	741	1.00000e+00	4.20000e-02	9.275
37	1	746	1.00000e+00	4.19828e-02	9.189
38	1	751	1.00000e+00	4.19658e-02	9.111
39	1	756	1.00000e+00	4.19490e-02	9.078
40	1	761	1.00000e+00	4.19321e-02	8.823
41	1	766	1.00000e+00	4.19162e-02	8.780
42	1	771	1.00000e+00	4.19005e-02	8.761
43	1	776	1.00000e+00	4.18848e-02	8.691
44	1	781	1.00000e+00	4.18692e-02	8.677
45	1	786	1.00000e+00	4.18537e-02	8.513
46	1	791	1.00000e+00	4.18385e-02	8.439
47	1	796	1.00000e+00	4.18236e-02	8.412
48	1	801	1.00000e+00	4.18086e-02	8.388
49	1	806	1.00000e+00	4.17938e-02	8.280
50	1	811	1.00000e+00	4.17792e-02	8.269
51	1	816	1.00000e+00	4.17647e-02	8.237
52	1	821	1.00000e+00	4.17503e-02	8.124
53	1	826	1.00000e+00	4.17362e-02	8.088
54	1	831	1.00000e+00	4.17223e-02	8.019
55	1	836	1.00000e+00	4.17084e-02	7.881
56	1	841	1.00000e+00	4.16949e-02	7.854

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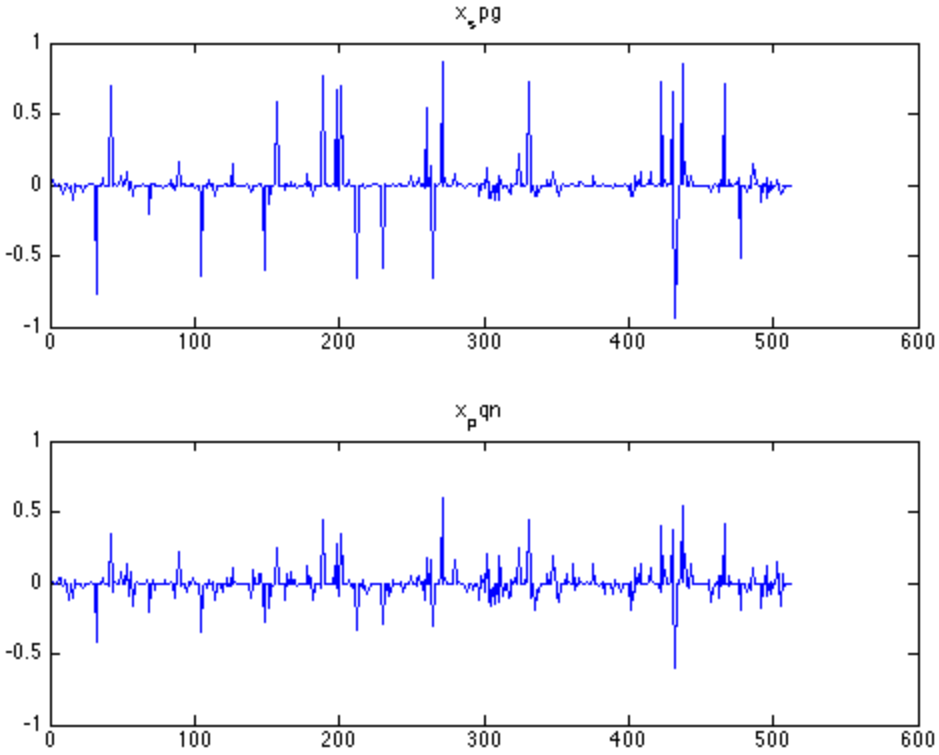
          57          1         846     1.00000e+00     4.16814e-02     7.848
          58          1         851     1.00000e+00     4.16679e-02     7.842
          59          1         856     1.00000e+00     4.16544e-02     7.837
          60          1         861     1.00000e+00     4.16410e-02     7.756
          61          1         866     1.00000e+00     4.16278e-02     7.666
          62          1         871     1.00000e+00     4.16148e-02     7.554
          63          1         876     1.00000e+00     4.16022e-02     7.554
          64          1         881     1.00000e+00     4.15896e-02     7.535
          65          1         886     1.00000e+00     4.15771e-02     7.484
          66          1         891     1.00000e+00     4.15646e-02     7.478
          67          1         896     1.00000e+00     4.15522e-02     7.467
          68          1         901     1.00000e+00     4.15397e-02     7.462
          69          1         906     1.00000e+00     4.15273e-02     7.439
          70          1         911     1.00000e+00     4.15149e-02     7.423
          71          1         916     1.00000e+00     4.15026e-02     7.393
          72          1         921     1.00000e+00     4.14902e-02     7.386
          73          1         926     1.00000e+00     4.14779e-02     7.378
          74          1         931     1.00000e+00     4.14656e-02     7.361
          75          1         936     1.00000e+00     4.14534e-02     7.317
          76          1         941     1.00000e+00     4.14412e-02     7.309
          77          1         946     1.00000e+00     4.14290e-02     7.241
          78          1         951     1.00000e+00     4.14170e-02     7.176
          79          1         956     1.00000e+00     4.14051e-02     7.145
          80          1         961     1.00000e+00     4.13933e-02     7.138
          81          1         966     1.00000e+00     4.13815e-02     7.133
          82          1         971     1.00000e+00     4.13697e-02     7.128
          83          1         976     1.00000e+00     4.13580e-02     7.071
          84          1         981     1.00000e+00     4.13464e-02     7.043
          85          1         986     1.00000e+00     4.13348e-02     7.035
          86          1         991     1.00000e+00     4.13233e-02     7.027
          87          1         996     1.00000e+00     4.13118e-02     7.019
          88          1        1001     1.00000e+00     4.13003e-02     7.012
          89          1        1006     1.00000e+00     4.12888e-02     6.987
          90          1        1011     1.00000e+00     4.12774e-02     6.946
          91          1        1016     1.00000e+00     4.12660e-02     6.939
          92          1        1021     1.00000e+00     4.12546e-02     6.933
          93          1        1026     1.00000e+00     4.12432e-02     6.927
          94          1        1031     1.00000e+00     4.12319e-02     6.921
          95          1        1036     1.00000e+00     4.12205e-02     6.916
          96          1        1041     1.00000e+00     4.12091e-02     6.910
          97          1        1046     1.00000e+00     4.11978e-02     6.905
          98          1        1051     1.00000e+00     4.11865e-02     6.900
          99          1        1056     1.00000e+00     4.11751e-02     6.895
         100          1        1061     1.00000e+00     4.11638e-02     6.890
  100  4.1163798e-02  2.4283229e-03   2.60e-04     0.0     236       0
ERROR EXIT -- Too many iterations

Products with A     :     102        Total time   (secs) :     2.3
Products with A'    :     102        Project time (secs) :     1.9
Newton iterations   :       0        Mat-vec time (secs) :     0.1
```

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================================================================================
SPGL1_SLIM v. 46  (Tue, 14 Jun 2011) based on v.1017
================================================================================
No. rows              :      350      No. columns           :      512
Initial tau           : 2.00e+01      Two-norm of b         : 1.72e-01
Optimality tol        : 1.00e-04      Target one-norm of x  : 2.00e+01
Basis pursuit tol     : 1.00e-06      Maximum iterations    :      100

 Iter      Objective   Relative Gap      gNorm   stepG    nnzX    nnzG
    0  1.7189650e-01  2.8590307e-01   1.43e-02     0.0       0       0
    1  1.6713633e-01  2.8807683e-01   1.41e-02    -0.3     227       0
    2  1.5011638e-01  1.2294129e-01   6.28e-03     0.0     438       0
    3  1.4436343e-01  4.0459005e-02   2.13e-03     0.0     449       0
    4  1.3825308e-01  4.2574865e-02   2.29e-03     0.0     464       0
    5  1.1026087e-01  1.8597106e-01   9.25e-03     0.0     496       0
    6  1.0817966e-01  1.7901075e-01   9.15e-03    -0.3     502       0
    7  9.9663596e-02  1.5261683e-02   9.23e-04     0.0     496       0
    8  9.8613143e-02  1.5954553e-02   9.67e-04     0.0     498       0
    9  8.5747961e-02  1.2831860e-02   8.15e-04     0.0     506       0
   10  8.5806584e-02  2.0257112e-01   1.03e-02    -0.3     477       0
   11  7.3626180e-02  4.4662432e-02   2.37e-03    -0.3     486       0
   12  7.2479807e-02  8.8120870e-03   6.10e-04     0.0     486       0
   13  7.1948082e-02  8.5991804e-03   5.97e-04     0.0     487       0
   14  6.5795953e-02  4.0667509e-02   2.26e-03     0.0     419       0
   15  6.6548217e-02  6.7044463e-02   3.50e-03    -0.3     430       0
```

16	6.4540429e-02	2.1397229e-02	1.28e-03	0.0	429	0
17	6.4098024e-02	9.1839870e-03	6.57e-04	0.0	419	0
18	6.3840614e-02	8.6554632e-03	6.31e-04	0.0	414	0
19	6.0602460e-02	1.1679717e-02	7.46e-04	0.0	369	0
20	6.1415514e-02	6.2473453e-02	3.33e-03	-0.3	378	0
21	6.1442314e-02	6.4326300e-02	3.34e-03	0.0	402	0
22	5.9399221e-02	6.6032906e-03	5.13e-04	0.0	376	0
23	5.9268017e-02	6.4261395e-03	5.01e-04	0.0	371	0
24	5.8391860e-02	6.2191240e-03	4.91e-04	0.0	356	0
25	5.0261069e-02	5.2194852e-02	2.80e-03	0.0	265	0
26	5.3989541e-02	9.9230460e-02	5.04e-03	-0.3	296	0
27	5.1584965e-02	6.8125329e-02	3.61e-03	0.0	361	0
28	4.8873118e-02	5.0691735e-03	4.17e-04	0.0	322	0
29	4.8752316e-02	4.8055179e-03	4.04e-04	0.0	316	0
30	4.7380143e-02	1.3474203e-02	8.37e-04	0.0	272	0
31	4.7886844e-02	3.6573752e-02	1.96e-03	-0.3	282	0
32	4.7268999e-02	1.8223551e-02	1.08e-03	0.0	286	0
33	4.6945838e-02	3.7412733e-03	3.42e-04	0.0	274	0
34	4.6880199e-02	3.7969958e-03	3.45e-04	0.0	270	0
35	4.6096574e-02	3.8047644e-03	3.48e-04	0.0	264	0
36	4.6121053e-02	4.1621414e-02	2.20e-03	-0.3	264	0
37	4.5173929e-02	5.3296494e-03	4.28e-04	-0.3	279	0
38	4.5019797e-02	3.5488689e-03	3.31e-04	0.0	267	0
39	4.4919224e-02	3.4183253e-03	3.26e-04	0.0	267	0
40	4.4106697e-02	9.1983161e-03	6.20e-04	0.0	253	0
41	4.4494726e-02	3.0490220e-02	1.65e-03	-0.3	257	0
42	4.4225482e-02	2.3194936e-02	1.33e-03	0.0	266	0
43	4.3770626e-02	3.3621968e-03	3.19e-04	0.0	252	0
44	4.3709567e-02	3.2501787e-03	3.16e-04	0.0	251	0
45	4.3517890e-02	3.2575264e-03	3.16e-04	0.0	250	0
46	3.9580939e-02	7.7152303e-02	3.93e-03	0.0	195	0
47	3.6710353e-02	2.6150117e-02	1.47e-03	-0.3	229	0
48	3.6346132e-02	2.3220670e-02	1.28e-03	0.0	222	0
49	3.5742969e-02	2.5691632e-03	2.71e-04	0.0	217	0
50	3.5660734e-02	2.0148236e-03	2.40e-04	0.0	216	0
51	3.5510571e-02	1.9450639e-03	2.35e-04	0.0	212	0
52	3.5352837e-02	3.4349551e-02	1.87e-03	-0.3	199	0
53	3.4748752e-02	1.1976266e-02	7.19e-04	-0.3	222	0
54	3.4486228e-02	5.3013369e-03	3.99e-04	0.0	204	0
55	3.4411832e-02	1.6638205e-03	2.13e-04	0.0	206	0
56	3.4351023e-02	1.7239469e-03	2.17e-04	0.0	204	0
57	3.3920322e-02	1.9263980e-02	1.08e-03	-0.3	189	0
58	3.3649505e-02	7.7689768e-03	5.25e-04	-0.3	195	0
59	3.3501215e-02	1.9630284e-03	2.26e-04	0.0	192	0
60	3.3455680e-02	1.5741845e-03	2.08e-04	0.0	191	0
61	3.3369358e-02	1.5527444e-03	2.07e-04	0.0	191	0
62	3.2680580e-02	4.6382497e-02	2.46e-03	0.0	174	0
63	3.2116108e-02	3.2808029e-02	1.73e-03	-0.3	212	0
64	3.1440274e-02	2.3240499e-02	1.29e-03	0.0	200	0
65	3.0848613e-02	2.3150203e-03	2.33e-04	0.0	192	0
66	3.0775691e-02	2.0936635e-03	2.23e-04	0.0	194	0
67	3.0345507e-02	1.5356552e-03	1.97e-04	0.0	198	0
68	2.9835130e-02	7.2379813e-03	4.75e-04	0.0	180	0
69	3.0504894e-02	3.0551107e-02	1.67e-03	-0.3	191	0

```
   70  2.9876638e-02  1.0512191e-02   6.37e-04     0.0     191       0
   71  2.9654518e-02  1.4075849e-03   1.91e-04     0.0     181       0
   72  2.9617202e-02  1.1454728e-03   1.77e-04     0.0     182       0
   73  2.9478360e-02  1.2391031e-03   1.81e-04     0.0     179       0
   74  2.9317811e-02  1.1475696e-02   6.81e-04    -0.3     178       0
   75  2.9375626e-02  1.5194843e-02   8.87e-04    -0.3     183       0
   76  2.9121261e-02  2.5556583e-03   2.42e-04     0.0     178       0
   77  2.9070878e-02  1.1945093e-03   1.77e-04     0.0     179       0
   78  2.9037870e-02  1.1688843e-03   1.75e-04     0.0     177       0
   79  2.5046503e-02  1.2136895e-03   1.64e-04     0.0     154       0
   80  2.6397515e-02  4.7455111e-02   2.50e-03    -0.3     155       0
   81  2.7945705e-02  5.8720810e-02   3.00e-03    -0.3     216       0
   82  2.5268325e-02  2.7071225e-02   1.48e-03     0.0     189       0
   83  2.4350856e-02  1.1761746e-03   1.63e-04     0.0     174       0
   84  2.4287877e-02  1.1278254e-03   1.61e-04     0.0     175       0
   85  2.3755240e-02  1.7077178e-02   9.63e-04     0.0     154       0
   86  2.3950479e-02  1.8571534e-02   1.01e-03    -0.3     172       0
   87  2.3551252e-02  8.7771895e-03   5.44e-04     0.0     155       0
   88  2.3407761e-02  9.6039814e-04   1.47e-04     0.0     155       0
   89  2.3379436e-02  9.5316637e-04   1.47e-04     0.0     155       0
   90  2.3214998e-02  9.3912058e-04   1.44e-04     0.0     154       0
   91  2.3222771e-02  1.5317570e-02   8.72e-04    -0.3     153       0
   92  2.2977944e-02  1.0488453e-03   1.49e-04    -0.3     156       0
   93  2.2936070e-02  1.1630274e-03   1.57e-04     0.0     156       0
   94  2.2900056e-02  8.6779366e-04   1.40e-04     0.0     156       0
   95  2.2763110e-02  1.1178448e-03   1.53e-04     0.0     152       0
   96  2.2833634e-02  1.3749689e-02   7.73e-04    -0.3     152       0
   97  2.2587013e-02  9.3776700e-04   1.44e-04    -0.3     152       0
   98  2.2544201e-02  1.0522621e-03   1.48e-04     0.0     152       0
   99  2.2498280e-02  8.5335665e-04   1.39e-04     0.0     153       0
  100  2.2393475e-02  1.8438899e-03   1.85e-04     0.0     152       0

 ERROR EXIT -- Too many iterations

 Products with A     :     152        Total time   (secs) :     0.3
 Products with A'    :     101        Project time (secs) :     0.1
 Newton iterations   :       0        Mat-vec time (secs) :     0.0
 Line search its     :     103        Subspace iterations :       0

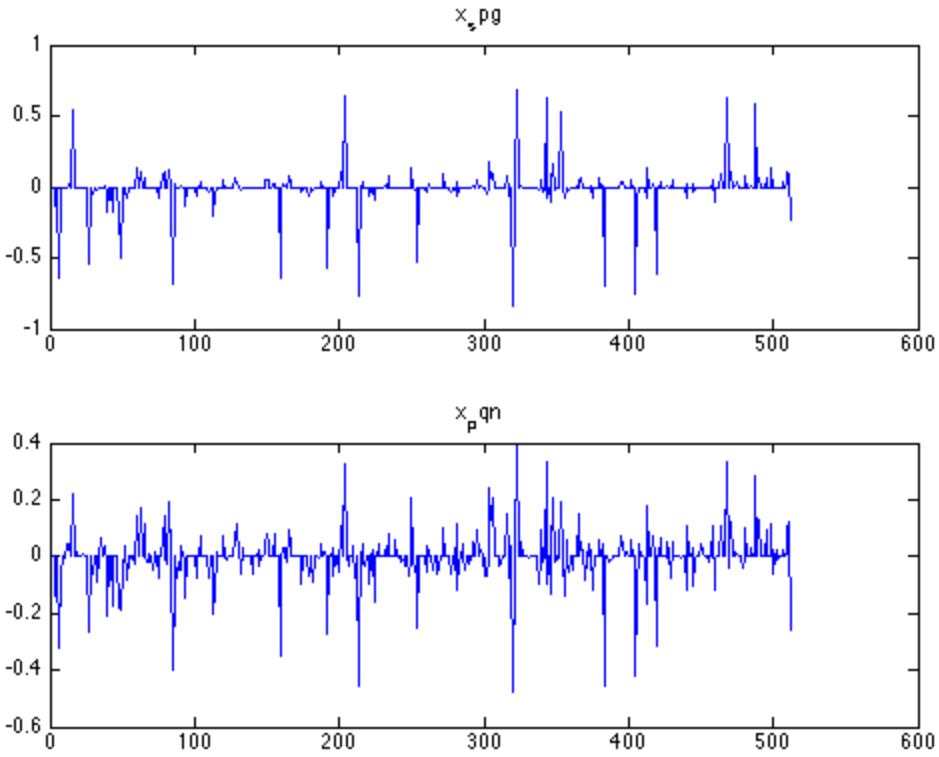

 ================================================================================
 PQNL1_SLIM v. 46  (Tue, 14 Jun 2011) based on v.1017
 ================================================================================
 No. rows              :      350      No. columns           :      512
 Initial tau           : 2.00e+01      Two-norm of b         : 1.72e-01
 Optimality tol        : 1.00e-04      Target one-norm of x  : 2.00e+01
 Basis pursuit tol     : 1.00e-06      Maximum iterations    :      100

  Iter      Objective   Relative Gap      gNorm   stepG    nnzX    nnzG
     0  1.7189650e-01  2.8590307e-01   1.43e-02     0.0       0       0
Inside of minConf_PQN
 Iteration   FunEvals Projections     Step Length          rNorm2        O
         1          1           4     1.00000e+00     1.63956e-01     4.620
         2          1          17     1.00000e+00     1.52121e-01     3.020
```

3	1	32	1.00000e+00	1.45089e-01	3.558
4	1	63	1.00000e+00	1.18986e-01	4.478
5	1	97	1.00000e+00	9.75149e-02	2.498
6	1	124	1.00000e+00	8.53799e-02	1.028
7	1	142	1.00000e+00	8.12162e-02	1.407
8	1	167	1.00000e+00	7.67977e-02	1.394
9	1	205	1.00000e+00	6.96953e-02	8.763
10	1	241	1.00000e+00	6.45113e-02	4.046
11	1	278	1.00000e+00	6.25924e-02	6.013
12	1	300	1.00000e+00	6.08363e-02	5.325
13	1	348	1.00000e+00	5.49317e-02	2.220
14	1	389	1.00000e+00	5.23007e-02	2.263
15	1	423	1.00000e+00	4.98068e-02	3.307
16	1	461	1.00000e+00	4.81052e-02	4.379
17	1	497	1.00000e+00	4.63350e-02	2.884
18	1	511	1.00000e+00	4.59588e-02	2.539
19	1	535	1.00000e+00	4.49418e-02	1.129
20	1	540	1.00000e+00	4.49205e-02	1.078
21	1	545	1.00000e+00	4.49006e-02	1.036
22	1	550	1.00000e+00	4.48817e-02	1.014
23	1	555	1.00000e+00	4.48634e-02	1.006
24	1	560	1.00000e+00	4.48453e-02	9.922
25	1	565	1.00000e+00	4.48277e-02	9.825
26	1	570	1.00000e+00	4.48104e-02	9.604
27	1	575	1.00000e+00	4.47937e-02	9.441
28	1	580	1.00000e+00	4.47772e-02	9.395
29	1	585	1.00000e+00	4.47609e-02	9.372
30	1	590	1.00000e+00	4.47446e-02	9.357
31	1	595	1.00000e+00	4.47284e-02	9.260
32	1	600	1.00000e+00	4.47125e-02	9.222
33	1	605	1.00000e+00	4.46966e-02	9.211
34	1	610	1.00000e+00	4.46809e-02	9.128
35	1	615	1.00000e+00	4.46653e-02	9.039
36	1	620	1.00000e+00	4.46499e-02	8.924
37	1	625	1.00000e+00	4.46349e-02	8.871
38	1	630	1.00000e+00	4.46199e-02	8.836
39	1	635	1.00000e+00	4.46050e-02	8.827
40	1	640	1.00000e+00	4.45902e-02	8.818
41	1	645	1.00000e+00	4.45753e-02	8.750
42	1	650	1.00000e+00	4.45607e-02	8.718
43	1	655	1.00000e+00	4.45460e-02	8.685
44	1	660	1.00000e+00	4.45315e-02	8.677
45	1	665	1.00000e+00	4.45169e-02	8.668
46	1	670	1.00000e+00	4.45024e-02	8.659
47	1	675	1.00000e+00	4.44879e-02	8.648
48	1	680	1.00000e+00	4.44734e-02	8.605
49	1	685	1.00000e+00	4.44590e-02	8.531
50	1	690	1.00000e+00	4.44448e-02	8.521
51	1	695	1.00000e+00	4.44305e-02	8.512
52	1	700	1.00000e+00	4.44163e-02	8.504
53	1	705	1.00000e+00	4.44020e-02	8.495
54	1	710	1.00000e+00	4.43878e-02	8.487
55	1	715	1.00000e+00	4.43736e-02	8.471
56	1	720	1.00000e+00	4.43595e-02	8.414

```
        57          1         725     1.00000e+00     4.43454e-02     8.406
        58          1         730     1.00000e+00     4.43314e-02     8.398
        59          1         735     1.00000e+00     4.43174e-02     8.390
        60          1         740     1.00000e+00     4.43034e-02     8.383
        61          1         745     1.00000e+00     4.42894e-02     8.375
        62          1         750     1.00000e+00     4.42754e-02     8.367
        63          1         755     1.00000e+00     4.42615e-02     8.360
        64          1         760     1.00000e+00     4.42475e-02     8.352
        65          1         765     1.00000e+00     4.42336e-02     8.345
        66          1         770     1.00000e+00     4.42197e-02     8.338
        67          1         775     1.00000e+00     4.42058e-02     8.289
        68          1         780     1.00000e+00     4.41919e-02     8.225
        69          1         785     1.00000e+00     4.41782e-02     8.217
        70          1         790     1.00000e+00     4.41646e-02     8.210
        71          1         795     1.00000e+00     4.41509e-02     8.203
        72          1         800     1.00000e+00     4.41373e-02     8.192
        73          1         805     1.00000e+00     4.41236e-02     8.181
        74          1         810     1.00000e+00     4.41100e-02     8.174
        75          1         815     1.00000e+00     4.40964e-02     8.167
        76          1         820     1.00000e+00     4.40828e-02     8.160
        77          1         825     1.00000e+00     4.40692e-02     8.153
        78          1         830     1.00000e+00     4.40556e-02     8.146
        79          1         835     1.00000e+00     4.40421e-02     8.138
        80          1         840     1.00000e+00     4.40285e-02     8.124
        81          1         845     1.00000e+00     4.40150e-02     8.117
        82          1         850     1.00000e+00     4.40015e-02     8.110
        83          1         855     1.00000e+00     4.39880e-02     8.103
        84          1         860     1.00000e+00     4.39745e-02     8.096
        85          1         865     1.00000e+00     4.39610e-02     8.089
        86          1         870     1.00000e+00     4.39476e-02     8.083
        87          1         875     1.00000e+00     4.39341e-02     8.076
        88          1         880     1.00000e+00     4.39207e-02     8.069
        89          1         885     1.00000e+00     4.39072e-02     8.063
        90          1         890     1.00000e+00     4.38938e-02     8.056
        91          1         895     1.00000e+00     4.38804e-02     8.050
        92          1         900     1.00000e+00     4.38670e-02     8.044
        93          1         905     1.00000e+00     4.38536e-02     8.038
        94          1         910     1.00000e+00     4.38403e-02     8.032
        95          1         915     1.00000e+00     4.38269e-02     8.026
        96          1         920     1.00000e+00     4.38136e-02     8.021
        97          1         925     1.00000e+00     4.38002e-02     7.992
        98          1         930     1.00000e+00     4.37869e-02     7.983
        99          1         935     1.00000e+00     4.37736e-02     7.972
       100          1         940     1.00000e+00     4.37604e-02     7.946
  100  4.3760353e-02  3.3814498e-03   3.13e-04     0.0     243       0
ERROR EXIT -- Too many iterations

Products with A     :     102        Total time   (secs) :     2.2
Products with A'    :     102        Project time (secs) :     1.5
Newton iterations   :       0        Mat-vec time (secs) :     0.1
```




```
================================================================================
SPGL1_SLIM v. 46  (Tue, 14 Jun 2011) based on v.1017
================================================================================
No. rows              :      400      No. columns           :      512
Initial tau           : 2.00e+01      Two-norm of b         : 2.48e-01
Optimality tol        : 1.00e-04      Target one-norm of x  : 2.00e+01
Basis pursuit tol     : 1.00e-06      Maximum iterations    :      100

 Iter      Objective   Relative Gap      gNorm   stepG    nnzX    nnzG
    0  2.4842278e-01  9.5042163e-01  4.75e-02     0.0       0       0
    1  1.9260958e-01  3.5583748e-01  1.73e-02    -0.3     325       0
    2  1.7985097e-01  5.2648468e-02  2.78e-03     0.0     432       0
    3  1.7395489e-01  4.9783273e-02  2.62e-03     0.0     459       0
    4  1.3695733e-01  1.0401664e-01  5.56e-03     0.0     497       0
    5  1.3373633e-01  1.1114923e-01  5.64e-03    -0.3     498       0
    6  1.3038945e-01  6.9497284e-02  3.82e-03     0.0     495       0
    7  1.2764561e-01  3.8957892e-02  2.15e-03     0.0     493       0
    8  1.2461255e-01  4.9390579e-02  2.81e-03     0.0     501       0
    9  1.2219543e-01  1.7154750e-01  8.59e-03     0.0     500       0
   10  1.1793584e-01  7.6227018e-02  4.19e-03    -0.3     499       0
   11  1.1589101e-01  2.4238425e-02  1.47e-03     0.0     502       0
   12  1.1402775e-01  2.2081711e-02  1.40e-03     0.0     501       0
   13  1.0097795e-01  1.3475892e-01  6.81e-03     0.0     485       0
   14  1.0859658e-01  2.8398928e-01  1.47e-02    -0.3     492       0
   15  9.6979137e-02  2.6747415e-02  1.57e-03     0.0     493       0
```

16	9.6349546e-02	1.6836791e-02	1.13e-03	0.0	487	0
17	9.5473792e-02	1.6508568e-02	1.11e-03	0.0	479	0
18	6.9124663e-02	1.1856397e-01	6.34e-03	0.0	232	0
19	9.2965129e-02	4.0989371e-01	2.01e-02	-0.3	252	0
20	8.8795168e-02	3.3194172e-01	1.72e-02	0.0	416	0
21	6.7048934e-02	1.9144373e-02	1.23e-03	0.0	384	0
22	6.6329492e-02	6.9726969e-03	6.38e-04	0.0	404	0
23	6.4880259e-02	6.4797267e-03	6.04e-04	0.0	331	0
24	6.6003890e-02	1.7627767e-01	9.24e-03	0.0	238	0
25	6.4601682e-02	1.5240694e-01	7.65e-03	-0.3	311	0
26	6.0160602e-02	5.6411692e-02	3.15e-03	0.0	355	0
27	5.8998593e-02	6.1632872e-03	5.54e-04	0.0	297	0
28	5.8808432e-02	5.9110919e-03	5.45e-04	0.0	285	0
29	5.6044676e-02	4.2589798e-02	2.44e-03	0.0	234	0
30	5.7061140e-02	8.0977592e-02	4.19e-03	-0.3	251	0
31	5.5760132e-02	3.3237768e-02	1.96e-03	0.0	260	0
32	5.5163750e-02	4.7216119e-03	4.79e-04	0.0	238	0
33	5.5041062e-02	4.3712843e-03	4.67e-04	0.0	237	0
34	5.4145286e-02	4.5316112e-03	4.83e-04	0.0	230	0
35	5.4365286e-02	7.0975217e-02	3.69e-03	-0.3	230	0
36	5.3100786e-02	3.4410097e-03	4.25e-04	-0.3	247	0
37	5.2907702e-02	4.4508960e-03	4.58e-04	0.0	237	0
38	5.2638531e-02	3.6086522e-03	4.26e-04	0.0	231	0
39	5.1561686e-02	2.0609783e-02	1.23e-03	0.0	215	0
40	5.1459365e-02	2.6103655e-02	1.58e-03	-0.3	220	0
41	5.1133717e-02	6.7599791e-03	5.59e-04	0.0	214	0
42	5.0990658e-02	3.3280462e-03	4.05e-04	0.0	215	0
43	5.0826426e-02	3.4348042e-03	4.07e-04	0.0	214	0
44	4.4785409e-02	8.5474647e-02	4.58e-03	0.0	167	0
45	4.8346109e-02	1.3806470e-01	6.92e-03	-0.3	196	0
46	4.7446434e-02	1.1229435e-01	5.97e-03	0.0	302	0
47	4.2841944e-02	8.8015927e-03	6.37e-04	0.0	215	0
48	4.2656073e-02	2.6363335e-03	3.42e-04	0.0	219	0
49	4.2397272e-02	2.6347753e-03	3.39e-04	0.0	214	0
50	4.2233644e-02	9.0400500e-02	4.82e-03	-0.3	162	0
51	3.9729264e-02	2.2257268e-02	1.27e-03	-0.3	199	0
52	3.9379962e-02	1.0195286e-02	7.21e-04	0.0	182	0
53	3.9232505e-02	2.3555501e-03	3.11e-04	0.0	185	0
54	3.9131029e-02	2.4446911e-03	3.19e-04	0.0	175	0
55	3.8228226e-02	2.8773185e-02	1.59e-03	0.0	166	0
56	3.8110572e-02	2.2501715e-02	1.35e-03	-0.3	174	0
57	3.7756780e-02	4.3752736e-03	3.98e-04	0.0	168	0
58	3.7669101e-02	2.1448334e-03	2.97e-04	0.0	168	0
59	3.7565415e-02	2.1707430e-03	2.99e-04	0.0	168	0
60	2.8812223e-02	3.8092541e-03	3.50e-04	0.0	133	0
61	3.2477620e-02	1.0441908e-01	5.23e-03	-0.3	143	0
62	2.8113084e-02	3.0842298e-03	3.20e-04	-0.3	192	0
63	2.7908877e-02	2.6953434e-03	2.83e-04	0.0	181	0
64	2.7751633e-02	1.7789027e-03	2.39e-04	0.0	176	0
65	2.7066276e-02	1.9819288e-02	1.16e-03	0.0	146	0
66	2.6918654e-02	1.3372625e-02	7.93e-04	-0.3	152	0
67	2.6760727e-02	4.7121430e-03	3.90e-04	0.0	149	0
68	2.6685267e-02	1.2766153e-03	2.07e-04	0.0	148	0
69	2.6633531e-02	1.2660866e-03	2.08e-04	0.0	148	0

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   70  2.5401460e-02  1.9283060e-03   2.30e-04     0.0     140       0
   71  2.5434175e-02  3.5916237e-02   1.98e-03    -0.3     141       0
   72  2.4696238e-02  3.4895536e-03   3.03e-04    -0.3     149       0
   73  2.4583105e-02  1.5441526e-03   2.17e-04     0.0     146       0
   74  2.4516419e-02  1.0994023e-03   1.90e-04     0.0     149       0
   75  2.4328552e-02  3.1373271e-03   2.98e-04     0.0     144       0
   76  2.4249780e-02  5.8479086e-03   4.15e-04    -0.3     147       0
   77  2.4245174e-02  1.2738534e-02   7.89e-04     0.0     142       0
   78  2.4104265e-02  3.8507668e-03   3.17e-04     0.0     143       0
   79  2.4036076e-02  1.1511180e-03   1.92e-04     0.0     143       0
   80  2.3987567e-02  1.0772571e-03   1.86e-04     0.0     142       0
   81  2.3510582e-02  5.7040365e-03   4.25e-04     0.0     140       0
   82  2.3715919e-02  2.4241880e-02   1.31e-03    -0.3     145       0
   83  2.3914689e-02  2.8016431e-02   1.57e-03     0.0     147       0
   84  2.3298720e-02  4.1248480e-03   3.27e-04     0.0     143       0
   85  2.3228021e-02  1.0063754e-03   1.79e-04     0.0     141       0
   86  2.3173414e-02  1.0377758e-03   1.81e-04     0.0     141       0
   87  2.1279428e-02  9.6705178e-04   1.69e-04     0.0     134       0
   88  2.0966539e-02  4.8046281e-02   2.45e-03    -0.3     135       0
   89  2.2183316e-02  5.6652016e-02   3.02e-03    -0.3     178       0
   90  2.0271251e-02  2.9212560e-02   1.54e-03     0.0     143       0
   91  1.9553889e-02  7.2327642e-04   1.51e-04     0.0     142       0
   92  1.9481358e-02  7.7966346e-04   1.52e-04     0.0     142       0
   93  1.8624222e-02  2.2841989e-02   1.27e-03     0.0     135       0
   94  1.9292264e-02  3.7666526e-02   1.94e-03    -0.3     150       0
   95  1.8639438e-02  2.0074104e-02   1.14e-03     0.0     135       0
   96  1.8169253e-02  1.1412082e-03   1.58e-04     0.0     135       0
   97  1.8127379e-02  7.3408683e-04   1.40e-04     0.0     135       0
   98  1.7984025e-02  8.4208273e-04   1.47e-04     0.0     135       0
   99  1.7630877e-02  2.5513326e-02   1.34e-03    -0.3     133       0
  100  1.7458448e-02  1.5886334e-02   9.19e-04    -0.3     140       0

 ERROR EXIT -- Too many iterations

 Products with A     :     150        Total time   (secs) :     0.4
 Products with A'    :     101        Project time (secs) :     0.1
 Newton iterations   :       0        Mat-vec time (secs) :     0.1
 Line search its     :      95        Subspace iterations :       0

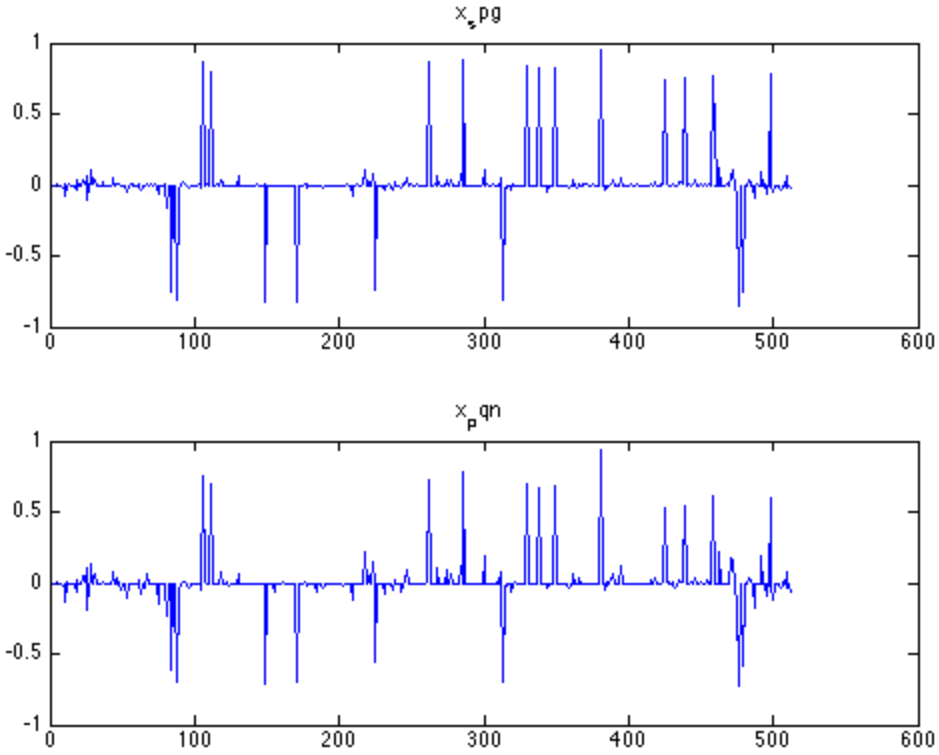

 ================================================================================
 PQNL1_SLIM v. 46  (Tue, 14 Jun 2011) based on v.1017
 ================================================================================
 No. rows              :      400      No. columns           :      512
 Initial tau           : 2.00e+01      Two-norm of b         : 2.48e-01
 Optimality tol        : 1.00e-04      Target one-norm of x  : 2.00e+01
 Basis pursuit tol     : 1.00e-06      Maximum iterations    :      100

  Iter      Objective   Relative Gap      gNorm   stepG    nnzX    nnzG
     0  2.4842278e-01  9.5042163e-01   4.75e-02     0.0       0       0
Inside of minConf_PQN
 Iteration   FunEvals Projections     Step Length          rNorm2        O
         1          1           4     1.00000e+00     2.11810e-01     1.040
         2          1          15     1.00000e+00     1.80832e-01     3.221
```

3	1	28	1.00000e+00	1.75522e-01	3.301
4	1	57	1.00000e+00	1.35773e-01	3.801
5	1	88	1.00000e+00	1.14031e-01	2.839
6	1	116	1.00000e+00	9.84824e-02	8.342
7	1	145	1.00000e+00	9.19745e-02	1.210
8	1	172	1.00000e+00	8.93673e-02	1.061
9	1	223	1.00000e+00	7.98062e-02	5.394
10	1	248	1.00000e+00	7.73053e-02	5.475
11	1	323	1.00000e+00	6.88419e-02	3.221
12	1	392	1.00000e+00	6.05018e-02	1.751
13	1	457	1.00000e+00	5.11305e-02	1.476
14	1	490	1.00000e+00	3.80015e-02	1.111
15	1	529	1.00000e+00	3.34054e-02	5.985
16	1	546	1.00000e+00	3.27061e-02	3.165
17	1	557	1.00000e+00	3.22749e-02	1.426
18	1	562	1.00000e+00	3.22395e-02	1.179
19	1	567	1.00000e+00	3.22123e-02	1.012
20	1	572	1.00000e+00	3.21897e-02	9.350
21	1	577	1.00000e+00	3.21695e-02	9.101
22	1	582	1.00000e+00	3.21500e-02	8.794
23	1	587	1.00000e+00	3.21314e-02	8.463
24	1	592	1.00000e+00	3.21137e-02	8.260
25	1	597	1.00000e+00	3.20965e-02	7.966
26	1	602	1.00000e+00	3.20800e-02	7.769
27	1	607	1.00000e+00	3.20638e-02	7.595
28	1	612	1.00000e+00	3.20481e-02	7.479
29	1	617	1.00000e+00	3.20325e-02	7.344
30	1	622	1.00000e+00	3.20172e-02	7.197
31	1	627	1.00000e+00	3.20022e-02	7.118
32	1	632	1.00000e+00	3.19873e-02	7.069
33	1	637	1.00000e+00	3.19725e-02	6.998
34	1	642	1.00000e+00	3.19578e-02	6.950
35	1	647	1.00000e+00	3.19432e-02	6.889
36	1	652	1.00000e+00	3.19287e-02	6.853
37	1	657	1.00000e+00	3.19142e-02	6.802
38	1	662	1.00000e+00	3.18998e-02	6.771
39	1	667	1.00000e+00	3.18855e-02	6.725
40	1	672	1.00000e+00	3.18712e-02	6.704
41	1	677	1.00000e+00	3.18570e-02	6.636
42	1	682	1.00000e+00	3.18429e-02	6.581
43	1	687	1.00000e+00	3.18288e-02	6.512
44	1	692	1.00000e+00	3.18149e-02	6.490
45	1	697	1.00000e+00	3.18010e-02	6.444
46	1	702	1.00000e+00	3.17871e-02	6.394
47	1	707	1.00000e+00	3.17734e-02	6.365
48	1	712	1.00000e+00	3.17597e-02	6.343
49	1	717	1.00000e+00	3.17460e-02	6.326
50	1	722	1.00000e+00	3.17323e-02	6.312
51	1	727	1.00000e+00	3.17187e-02	6.270
52	1	732	1.00000e+00	3.17051e-02	6.241
53	1	737	1.00000e+00	3.16916e-02	6.223
54	1	742	1.00000e+00	3.16781e-02	6.184
55	1	747	1.00000e+00	3.16647e-02	6.156
56	1	752	1.00000e+00	3.16513e-02	6.114

```
          57          1         757     1.00000e+00     3.16379e-02     6.084
          58          1         762     1.00000e+00     3.16246e-02     6.074
          59          1         767     1.00000e+00     3.16113e-02     6.060
          60          1         772     1.00000e+00     3.15981e-02     6.039
          61          1         777     1.00000e+00     3.15849e-02     6.025
          62          1         782     1.00000e+00     3.15717e-02     6.005
          63          1         787     1.00000e+00     3.15585e-02     5.979
          64          1         792     1.00000e+00     3.15454e-02     5.968
          65          1         797     1.00000e+00     3.15322e-02     5.958
          66          1         802     1.00000e+00     3.15191e-02     5.946
          67          1         807     1.00000e+00     3.15061e-02     5.927
          68          1         812     1.00000e+00     3.14930e-02     5.908
          69          1         817     1.00000e+00     3.14800e-02     5.895
          70          1         822     1.00000e+00     3.14670e-02     5.878
          71          1         827     1.00000e+00     3.14540e-02     5.869
          72          1         832     1.00000e+00     3.14411e-02     5.860
          73          1         837     1.00000e+00     3.14281e-02     5.851
          74          1         842     1.00000e+00     3.14152e-02     5.842
          75          1         847     1.00000e+00     3.14023e-02     5.833
          76          1         852     1.00000e+00     3.13894e-02     5.823
          77          1         857     1.00000e+00     3.13766e-02     5.812
          78          1         862     1.00000e+00     3.13637e-02     5.803
          79          1         867     1.00000e+00     3.13509e-02     5.795
          80          1         872     1.00000e+00     3.13381e-02     5.785
          81          1         877     1.00000e+00     3.13254e-02     5.745
          82          1         882     1.00000e+00     3.13126e-02     5.735
          83          1         887     1.00000e+00     3.12999e-02     5.727
          84          1         892     1.00000e+00     3.12872e-02     5.719
          85          1         897     1.00000e+00     3.12745e-02     5.711
          86          1         902     1.00000e+00     3.12619e-02     5.703
          87          1         907     1.00000e+00     3.12492e-02     5.696
          88          1         912     1.00000e+00     3.12366e-02     5.688
          89          1         917     1.00000e+00     3.12240e-02     5.681
          90          1         922     1.00000e+00     3.12114e-02     5.673
          91          1         927     1.00000e+00     3.11988e-02     5.666
          92          1         932     1.00000e+00     3.11863e-02     5.659
          93          1         937     1.00000e+00     3.11738e-02     5.652
          94          1         942     1.00000e+00     3.11612e-02     5.644
          95          1         947     1.00000e+00     3.11487e-02     5.631
          96          1         952     1.00000e+00     3.11362e-02     5.619
          97          1         957     1.00000e+00     3.11238e-02     5.612
          98          1         962     1.00000e+00     3.11113e-02     5.605
          99          1         967     1.00000e+00     3.10989e-02     5.598
         100          1         972     1.00000e+00     3.10865e-02     5.592
  100  3.1086472e-02  2.7956684e-03   2.81e-04     0.0     156       0
ERROR EXIT -- Too many iterations

Products with A     :     102        Total time   (secs) :     2.6
Products with A'    :     102        Project time (secs) :     1.9
Newton iterations   :       0        Mat-vec time (secs) :     0.1
```




```
================================================================================
SPGL1_SLIM v. 46  (Tue, 14 Jun 2011) based on v.1017
================================================================================
No. rows              :      450      No. columns           :      512
Initial tau           : 2.00e+01      Two-norm of b         : 2.94e-01
Optimality tol        : 1.00e-04      Target one-norm of x  : 2.00e+01
Basis pursuit tol     : 1.00e-06      Maximum iterations    :      100

 Iter      Objective   Relative Gap      gNorm   stepG    nnzX    nnzG
    0  2.9382436e-01  1.1368684e+00  5.68e-02     0.0       0       0
    1  2.2177762e-01  2.7227115e-01  1.31e-02    -0.3     319       0
    2  2.0891800e-01  8.7673160e-02  4.59e-03     0.0     440       0
    3  1.9945115e-01  7.8335992e-02  4.12e-03     0.0     471       0
    4  1.4692943e-01  1.9165069e-01  1.01e-02     0.0     501       0
    5  1.4178034e-01  1.1002817e-01  5.62e-03    -0.3     501       0
    6  1.3869240e-01  3.1360200e-02  1.92e-03     0.0     502       0
    7  1.3604886e-01  2.9393820e-02  1.77e-03     0.0     504       0
    8  1.2411425e-01  1.4778844e-01  7.95e-03     0.0     499       0
    9  1.2072725e-01  5.9470906e-02  3.22e-03    -0.3     501       0
   10  1.1922989e-01  2.5427022e-02  1.65e-03     0.0     495       0
   11  1.1788862e-01  2.4026392e-02  1.55e-03     0.0     491       0
   12  1.1042272e-01  1.3394700e-01  7.29e-03     0.0     433       0
   13  1.1063310e-01  1.5933638e-01  8.07e-03    -0.3     451       0
   14  1.0657200e-01  3.5898461e-02  2.27e-03     0.0     455       0
   15  1.0574053e-01  1.8884358e-02  1.34e-03     0.0     441       0
```

16	1.0489813e-01	1.8257259e-02	1.32e-03	0.0	429	0
17	8.3874030e-02	7.6115881e-02	4.03e-03	0.0	284	0
18	9.6662631e-02	2.7607896e-01	1.45e-02	-0.3	332	0
19	8.6076595e-02	1.4002531e-01	7.12e-03	0.0	397	0
20	8.1948706e-02	9.3346368e-03	8.48e-04	0.0	375	0
21	8.1496391e-02	9.3764416e-03	8.44e-04	0.0	362	0
22	7.1099399e-02	5.1240392e-02	2.98e-03	0.0	235	0
23	7.7484251e-02	1.9648376e-01	9.80e-03	-0.3	261	0
24	7.8600528e-02	1.9212645e-01	1.02e-02	0.0	380	0
25	6.9539150e-02	8.9997760e-03	7.73e-04	0.0	333	0
26	6.9247671e-02	7.0385991e-03	6.94e-04	0.0	322	0
27	6.8364998e-02	6.6503329e-03	6.71e-04	0.0	278	0
28	5.5278978e-02	9.6518456e-02	5.24e-03	0.0	187	0
29	5.6904279e-02	1.2283837e-01	6.20e-03	-0.3	216	0
30	5.7431360e-02	1.2016371e-01	6.48e-03	0.0	322	0
31	5.2444460e-02	6.9435523e-03	6.10e-04	0.0	250	0
32	5.2226387e-02	4.6910578e-03	5.14e-04	0.0	252	0
33	5.1727545e-02	4.4479773e-03	5.01e-04	0.0	234	0
34	4.5294446e-02	4.4001250e-03	4.68e-04	0.0	171	0
35	5.0254052e-02	8.9558601e-02	4.79e-03	-0.3	183	0
36	4.7678613e-02	9.5869989e-02	4.83e-03	-0.3	246	0
37	4.5765068e-02	7.3413730e-02	4.01e-03	0.0	319	0
38	4.2831203e-02	1.0560572e-02	7.23e-04	0.0	292	0
39	4.2281521e-02	9.4477694e-03	6.90e-04	0.0	295	0
40	4.0710980e-02	5.4610913e-03	4.94e-04	0.0	283	0
41	3.8405127e-02	1.4212336e-02	9.71e-04	0.0	242	0
42	3.8155641e-02	9.6347592e-03	6.87e-04	-0.3	242	0
43	3.7935814e-02	3.9793616e-03	4.39e-04	0.0	233	0
44	3.7742883e-02	3.4666768e-03	3.85e-04	0.0	231	0
45	3.7529608e-02	3.2604629e-03	3.95e-04	0.0	225	0
46	3.7279498e-02	1.5179646e-02	9.46e-04	0.0	213	0
47	3.7107244e-02	9.7470322e-03	7.28e-04	-0.3	212	0
48	3.6905737e-02	3.6291982e-03	3.85e-04	0.0	208	0
49	3.6782305e-02	2.3580461e-03	3.34e-04	0.0	207	0
50	3.6536184e-02	2.4683089e-03	3.31e-04	0.0	199	0
51	3.5748239e-02	4.4908848e-02	2.52e-03	-0.3	178	0
52	3.5270090e-02	3.0660852e-02	1.68e-03	-0.3	203	0
53	3.4774528e-02	1.4170769e-02	9.44e-04	0.0	184	0
54	3.4522001e-02	2.1127457e-03	3.08e-04	0.0	184	0
55	3.4430248e-02	2.0433642e-03	3.07e-04	0.0	184	0
56	3.3421865e-02	2.2798472e-03	3.01e-04	0.0	168	0
57	3.3016826e-02	5.3686129e-02	2.96e-03	-0.3	169	0
58	3.2862119e-02	4.9503906e-02	2.58e-03	-0.3	214	0
59	3.1925485e-02	2.5539918e-02	1.52e-03	0.0	184	0
60	3.1342925e-02	1.7096123e-03	2.73e-04	0.0	179	0
61	3.1251676e-02	1.8312863e-03	2.82e-04	0.0	178	0
62	3.0472144e-02	2.2165903e-03	3.00e-04	0.0	170	0
63	3.0022890e-02	3.2334881e-02	1.74e-03	-0.3	170	0
64	2.9858076e-02	2.1951017e-02	1.32e-03	-0.3	191	0
65	2.9380595e-02	6.2844292e-03	4.78e-04	0.0	172	0
66	2.9271710e-02	1.5921989e-03	2.56e-04	0.0	175	0
67	2.9167980e-02	1.5948906e-03	2.55e-04	0.0	172	0
68	2.8804016e-02	8.7420353e-02	4.65e-03	-0.3	136	0
69	2.8095822e-02	7.7556386e-02	3.90e-03	-0.3	179	0

```
   70  2.7514270e-02  6.4841268e-02   3.51e-03     0.0     229       0
   71  2.4498745e-02  1.7411972e-03   2.37e-04     0.0     168       0
   72  2.4394277e-02  1.3330439e-03   2.23e-04     0.0     173       0
   73  2.4091737e-02  1.5312740e-03   2.32e-04     0.0     164       0
   74  2.3383661e-02  4.9210607e-02   2.51e-03     0.0     137       0
   75  2.3040617e-02  3.3887300e-02   1.90e-03    -0.3     175       0
   76  2.2141208e-02  1.8477746e-02   1.03e-03     0.0     144       0
   77  2.1776754e-02  1.2058528e-03   1.99e-04     0.0     148       0
   78  2.1709487e-02  1.1053998e-03   1.91e-04     0.0     146       0
   79  2.0936714e-02  5.4546974e-03   4.15e-04     0.0     140       0
   80  2.0938480e-02  1.4536062e-02   8.29e-04    -0.3     140       0
   81  2.1079404e-02  1.9652420e-02   1.15e-03     0.0     143       0
   82  2.0669705e-02  3.4680822e-03   2.93e-04     0.0     138       0
   83  2.0598544e-02  1.1677067e-03   1.87e-04     0.0     138       0
   84  2.0535425e-02  1.1707082e-03   1.87e-04     0.0     138       0
   85  1.5286619e-02  4.5247251e-02   2.42e-03     0.0     110       0
   86  1.5055969e-02  3.9861488e-02   2.02e-03    -0.3     126       0
   87  1.6084691e-02  4.7731648e-02   2.56e-03     0.0     151       0
   88  1.3457410e-02  8.2667622e-03   4.88e-04     0.0     120       0
   89  1.3277096e-02  1.0041815e-03   1.40e-04     0.0     117       0
   90  1.3215089e-02  9.8149422e-04   1.38e-04     0.0     117       0
   91  1.2280192e-02  1.2488583e-02   7.20e-04     0.0     115       0
   92  1.2833351e-02  2.5037335e-02   1.29e-03    -0.3     121       0
   93  1.2521423e-02  1.7140895e-02   9.65e-04     0.0     115       0
   94  1.2004358e-02  1.1477040e-03   1.29e-04     0.0     113       0
   95  1.1966719e-02  8.0045676e-04   1.15e-04     0.0     113       0
   96  1.1898795e-02  7.8335011e-04   1.14e-04     0.0     115       0
   97  9.9912025e-03  5.0605752e-03   3.29e-04     0.0     114       0
   98  1.0649510e-02  2.2857557e-02   1.17e-03    -0.3     115       0
   99  1.1461921e-02  3.0509211e-02   1.65e-03     0.0     128       0
  100  1.0003896e-02  7.6512147e-03   4.36e-04     0.0     110       0
NOTE: solution not actually optimal, best objective value is 9.9912025e-03
 ERROR EXIT -- Too many iterations

 Products with A     :     145        Total time   (secs) :     0.3
 Products with A'    :     101        Project time (secs) :     0.1
 Newton iterations   :       0        Mat-vec time (secs) :     0.1
 Line search its     :      86        Subspace iterations :       0

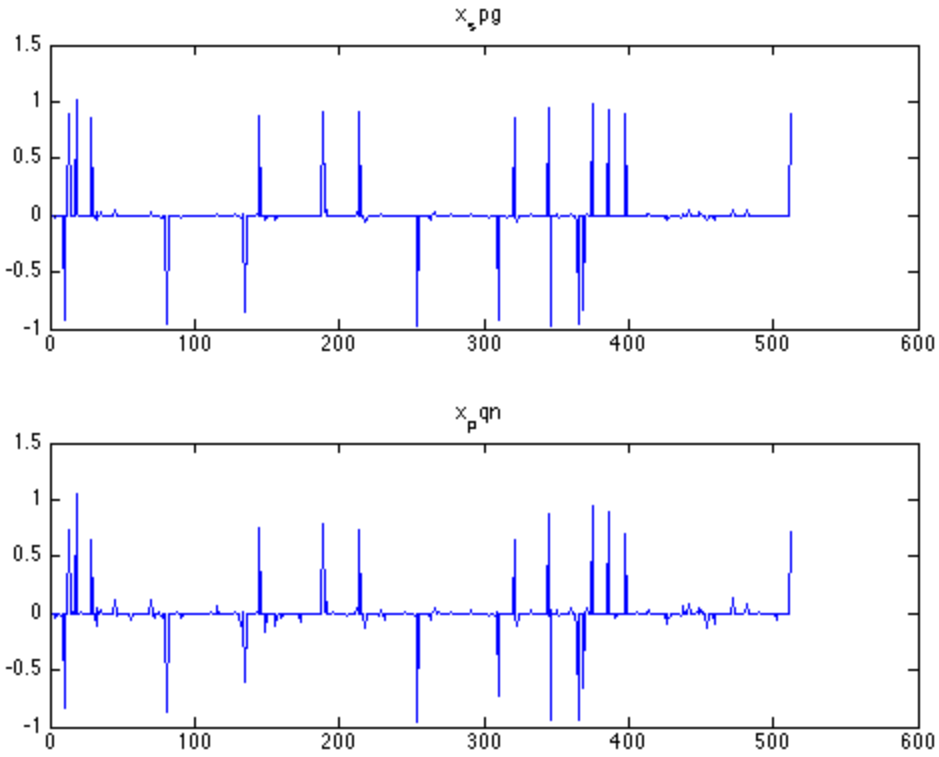

 ================================================================================
 PQNL1_SLIM v. 46  (Tue, 14 Jun 2011) based on v.1017
 ================================================================================
 No. rows              :      450      No. columns           :      512
 Initial tau           : 2.00e+01      Two-norm of b         : 2.94e-01
 Optimality tol        : 1.00e-04      Target one-norm of x  : 2.00e+01
 Basis pursuit tol     : 1.00e-06      Maximum iterations    :      100

  Iter      Objective   Relative Gap      gNorm   stepG    nnzX    nnzG
     0  2.9382436e-01  1.1368684e+00   5.68e-02     0.0       0       0
Inside of minConf_PQN
 Iteration   FunEvals Projections     Step Length          rNorm2        O
         1          1           4     1.00000e+00     2.48941e-01     1.238
         2          1          15     1.00000e+00     2.09826e-01     4.015
```

3	1	28	1.00000e+00	2.02516e-01	4.192
4	1	54	1.00000e+00	1.50549e-01	4.791
5	1	84	1.00000e+00	1.28222e-01	2.294
6	1	111	1.00000e+00	1.17698e-01	1.383
7	1	139	1.00000e+00	1.14579e-01	1.706
8	1	161	1.00000e+00	1.08085e-01	7.485
9	1	207	1.00000e+00	1.02135e-01	1.248
10	1	247	1.00000e+00	9.80063e-02	1.201
11	1	308	1.00000e+00	8.05022e-02	4.868
12	1	358	1.00000e+00	7.02101e-02	2.379
13	1	419	1.00000e+00	5.97300e-02	3.193
14	1	478	1.00000e+00	5.21026e-02	2.552
15	1	562	1.00000e+00	3.79746e-02	1.877
16	1	634	1.00000e+00	2.91823e-02	2.365
17	1	648	1.00000e+00	2.85088e-02	2.206
18	1	669	1.00000e+00	2.68551e-02	1.050
19	1	674	1.00000e+00	2.68272e-02	9.662
20	1	679	1.00000e+00	2.68016e-02	8.947
21	1	684	1.00000e+00	2.67776e-02	8.431
22	1	689	1.00000e+00	2.67555e-02	8.239
23	1	694	1.00000e+00	2.67339e-02	7.991
24	1	699	1.00000e+00	2.67128e-02	7.770
25	1	704	1.00000e+00	2.66920e-02	7.625
26	1	709	1.00000e+00	2.66715e-02	7.519
27	1	714	1.00000e+00	2.66513e-02	7.334
28	1	719	1.00000e+00	2.66313e-02	7.149
29	1	724	1.00000e+00	2.66117e-02	7.054
30	1	729	1.00000e+00	2.65923e-02	6.938
31	1	734	1.00000e+00	2.65732e-02	6.854
32	1	739	1.00000e+00	2.65543e-02	6.796
33	1	744	1.00000e+00	2.65354e-02	6.731
34	1	749	1.00000e+00	2.65167e-02	6.697
35	1	754	1.00000e+00	2.64981e-02	6.655
36	1	759	1.00000e+00	2.64795e-02	6.595
37	1	764	1.00000e+00	2.64611e-02	6.562
38	1	769	1.00000e+00	2.64427e-02	6.513
39	1	774	1.00000e+00	2.64245e-02	6.420
40	1	779	1.00000e+00	2.64064e-02	6.324
41	1	784	1.00000e+00	2.63886e-02	6.284
42	1	789	1.00000e+00	2.63708e-02	6.247
43	1	794	1.00000e+00	2.63531e-02	6.191
44	1	799	1.00000e+00	2.63355e-02	6.114
45	1	804	1.00000e+00	2.63181e-02	6.062
46	1	809	1.00000e+00	2.63007e-02	6.029
47	1	814	1.00000e+00	2.62834e-02	5.966
48	1	819	1.00000e+00	2.62663e-02	5.940
49	1	824	1.00000e+00	2.62491e-02	5.919
50	1	829	1.00000e+00	2.62321e-02	5.902
51	1	834	1.00000e+00	2.62150e-02	5.823
52	1	839	1.00000e+00	2.61981e-02	5.810
53	1	844	1.00000e+00	2.61813e-02	5.780
54	1	849	1.00000e+00	2.61645e-02	5.769
55	1	854	1.00000e+00	2.61477e-02	5.753
56	1	859	1.00000e+00	2.61310e-02	5.725

```
        57          1         864     1.00000e+00     2.61144e-02     5.701
        58          1         869     1.00000e+00     2.60977e-02     5.673
        59          1         874     1.00000e+00     2.60812e-02     5.659
        60          1         879     1.00000e+00     2.60646e-02     5.644
        61          1         884     1.00000e+00     2.60482e-02     5.633
        62          1         889     1.00000e+00     2.60317e-02     5.589
        63          1         894     1.00000e+00     2.60154e-02     5.534
        64          1         899     1.00000e+00     2.59991e-02     5.518
        65          1         904     1.00000e+00     2.59830e-02     5.460
        66          1         909     1.00000e+00     2.59669e-02     5.449
        67          1         914     1.00000e+00     2.59509e-02     5.439
        68          1         919     1.00000e+00     2.59349e-02     5.430
        69          1         924     1.00000e+00     2.59189e-02     5.420
        70          1         929     1.00000e+00     2.59030e-02     5.406
        71          1         934     1.00000e+00     2.58871e-02     5.389
        72          1         939     1.00000e+00     2.58712e-02     5.376
        73          1         944     1.00000e+00     2.58554e-02     5.366
        74          1         949     1.00000e+00     2.58395e-02     5.346
        75          1         954     1.00000e+00     2.58238e-02     5.325
        76          1         959     1.00000e+00     2.58080e-02     5.316
        77          1         964     1.00000e+00     2.57923e-02     5.306
        78          1         969     1.00000e+00     2.57767e-02     5.296
        79          1         974     1.00000e+00     2.57610e-02     5.267
        80          1         979     1.00000e+00     2.57454e-02     5.258
        81          1         984     1.00000e+00     2.57299e-02     5.243
        82          1         989     1.00000e+00     2.57143e-02     5.230
        83          1         994     1.00000e+00     2.56988e-02     5.222
        84          1         999     1.00000e+00     2.56833e-02     5.213
        85          1        1004     1.00000e+00     2.56679e-02     5.205
        86          1        1009     1.00000e+00     2.56524e-02     5.194
        87          1        1014     1.00000e+00     2.56370e-02     5.177
        88          1        1019     1.00000e+00     2.56217e-02     5.168
        89          1        1024     1.00000e+00     2.56063e-02     5.160
        90          1        1029     1.00000e+00     2.55910e-02     5.144
        91          1        1034     1.00000e+00     2.55757e-02     5.131
        92          1        1039     1.00000e+00     2.55604e-02     5.123
        93          1        1044     1.00000e+00     2.55452e-02     5.115
        94          1        1049     1.00000e+00     2.55300e-02     5.106
        95          1        1054     1.00000e+00     2.55148e-02     5.096
        96          1        1059     1.00000e+00     2.54996e-02     5.073
        97          1        1064     1.00000e+00     2.54845e-02     5.057
        98          1        1069     1.00000e+00     2.54694e-02     5.035
        99          1        1074     1.00000e+00     2.54543e-02     5.013
       100          1        1079     1.00000e+00     2.54392e-02     4.997
  100  2.5439239e-02  3.1393751e-03   2.80e-04     0.0     154       0
ERROR EXIT -- Too many iterations

Products with A     :     102        Total time   (secs) :     2.0
Products with A'    :     102        Project time (secs) :     1.5
Newton iterations   :       0        Mat-vec time (secs) :     0.1
```




```
================================================================================
SPGL1_SLIM v. 46  (Tue, 14 Jun 2011) based on v.1017
================================================================================
No. rows              :      500      No. columns           :      512
Initial tau           : 2.00e+01      Two-norm of b         : 3.18e-01
Optimality tol        : 1.00e-04      Target one-norm of x  : 2.00e+01
Basis pursuit tol     : 1.00e-06      Maximum iterations    :      100

 Iter      Objective   Relative Gap      gNorm   stepG    nnzX    nnzG
    0  3.1766730e-01  1.7725628e+00  8.86e-02     0.0       0       0
    1  2.1668622e-01  1.0690112e-01  5.27e-03    -0.3     432       0
    2  2.1043255e-01  7.6260179e-02  3.94e-03     0.0     461       0
    3  1.7598372e-01  5.6584148e-02  3.16e-03     0.0     491       0
    4  1.3852578e-01  4.7498601e-01  2.46e-02     0.0     451       0
    5  2.0199741e-01  1.3110371e+00  6.29e-02    -0.3     476       0
    6  1.2964989e-01  3.2216103e-01  1.69e-02     0.0     500       0
    7  1.2109642e-01  2.6223339e-02  1.69e-03     0.0     493       0
    8  1.1984353e-01  2.5524508e-02  1.66e-03     0.0     491       0
    9  9.6899541e-02  2.0131660e-01  1.08e-02     0.0     304       0
   10  1.0117343e-01  3.2413292e-01  1.61e-02    -0.3     332       0
   11  9.3935296e-02  1.2742796e-01  7.00e-03     0.0     396       0
   12  9.1507491e-02  1.3650460e-02  1.10e-03     0.0     366       0
   13  9.1018825e-02  1.2623060e-02  1.06e-03     0.0     350       0
   14  8.2829997e-02  3.5916448e-02  2.22e-03     0.0     286       0
   15  8.4119313e-02  1.7096852e-01  8.65e-03    -0.3     290       0
```

16	8.6166719e-02	2.1786840e-01	1.16e-02	0.0	359	0
17	8.0564483e-02	1.6243141e-02	1.15e-03	0.0	309	0
18	8.0230587e-02	1.0376176e-02	8.90e-04	0.0	304	0
19	7.9413515e-02	9.9753196e-03	8.69e-04	0.0	292	0
20	6.1051355e-02	2.2397963e-01	1.17e-02	0.0	157	0
21	7.0117698e-02	3.6375480e-01	1.79e-02	-0.3	178	0
22	6.3337490e-02	2.4129863e-01	1.27e-02	0.0	310	0
23	5.3521179e-02	3.1437531e-02	1.81e-03	0.0	302	0
24	5.2993892e-02	9.0576027e-03	7.32e-04	0.0	289	0
25	5.2417392e-02	8.4084347e-03	6.92e-04	0.0	269	0
26	5.0160393e-02	9.3861114e-02	5.08e-03	0.0	196	0
27	5.1530411e-02	1.3853125e-01	6.97e-03	-0.3	240	0
28	4.8557663e-02	3.4331148e-02	2.03e-03	0.0	238	0
29	4.8052337e-02	4.9908090e-03	5.03e-04	0.0	215	0
30	4.7873015e-02	4.7609821e-03	4.93e-04	0.0	211	0
31	4.4114788e-02	4.0515345e-02	2.34e-03	0.0	175	0
32	4.5511323e-02	1.0907286e-01	5.54e-03	-0.3	191	0
33	4.3925808e-02	4.8366051e-02	2.75e-03	0.0	217	0
34	4.3110344e-02	4.0708945e-03	4.39e-04	0.0	183	0
35	4.2972893e-02	4.1907487e-03	4.54e-04	0.0	183	0
36	4.2220962e-02	4.1075176e-03	4.52e-04	0.0	178	0
37	4.1441937e-02	9.6023656e-02	4.88e-03	-0.3	168	0
38	3.9830012e-02	1.9217822e-02	1.23e-03	-0.3	188	0
39	3.9490937e-02	4.6364898e-03	4.47e-04	0.0	174	0
40	3.9356280e-02	2.9722004e-03	3.74e-04	0.0	172	0
41	3.8851226e-02	3.1625867e-03	3.78e-04	0.0	164	0
42	3.7818039e-02	6.8590144e-02	3.75e-03	-0.3	163	0
43	3.6883819e-02	3.1123059e-02	1.72e-03	-0.3	175	0
44	3.6509050e-02	6.7367655e-03	5.70e-04	0.0	165	0
45	3.6388485e-02	2.6098007e-03	3.45e-04	0.0	165	0
46	3.6236470e-02	2.4750714e-03	3.41e-04	0.0	164	0
47	3.2621224e-02	8.8816766e-02	4.49e-03	0.0	140	0
48	3.4281426e-02	1.0748869e-01	5.72e-03	-0.3	170	0
49	3.1509729e-02	4.7239628e-02	2.48e-03	0.0	179	0
50	3.0678174e-02	2.1552106e-03	3.01e-04	0.0	149	0
51	3.0563788e-02	2.1396760e-03	2.98e-04	0.0	148	0
52	2.7171549e-02	2.3747032e-02	1.32e-03	0.0	139	0
53	2.8741647e-02	7.4817215e-02	4.02e-03	-0.3	145	0
54	2.7337680e-02	3.8110692e-02	2.02e-03	0.0	157	0
55	2.6719776e-02	3.3494612e-03	3.45e-04	0.0	139	0
56	2.6628075e-02	1.8190924e-03	2.58e-04	0.0	140	0
57	2.6422242e-02	1.8532367e-03	2.60e-04	0.0	140	0
58	2.5076470e-02	9.6970090e-02	4.84e-03	0.0	126	0
59	2.3624940e-02	5.8397186e-02	3.15e-03	-0.3	148	0
60	2.2323951e-02	3.2855948e-02	1.73e-03	0.0	135	0
61	2.1723230e-02	2.2430432e-03	2.55e-04	0.0	136	0
62	2.1611295e-02	2.0935615e-03	2.44e-04	0.0	138	0
63	2.0596964e-02	2.0762455e-03	2.46e-04	0.0	153	0
64	2.1184277e-02	5.4154540e-02	2.76e-03	-0.3	135	0
65	2.0056389e-02	1.4656092e-03	2.06e-04	-0.3	134	0
66	1.9980628e-02	1.3325463e-03	1.93e-04	0.0	134	0
67	1.9742360e-02	3.1818130e-03	2.96e-04	0.0	134	0
68	1.9654791e-02	8.5559201e-03	5.40e-04	-0.3	132	0
69	1.9672773e-02	1.7519832e-02	1.03e-03	0.0	135	0

```
   70  1.9501065e-02  8.0230614e-03   5.13e-04     0.0     131       0
   71  1.9409876e-02  1.4141618e-03   1.99e-04     0.0     131       0
   72  1.9362897e-02  1.3432837e-03   1.92e-04     0.0     131       0
   73  1.8938518e-02  4.6099649e-03   3.64e-04     0.0     127       0
   74  1.8994553e-02  2.2973359e-02   1.24e-03    -0.3     127       0
   75  1.9336367e-02  3.4970890e-02   1.93e-03     0.0     134       0
   76  1.8679126e-02  5.0799964e-03   3.66e-04     0.0     127       0
   77  1.8607800e-02  1.3094202e-03   1.88e-04     0.0     128       0
   78  1.8547568e-02  1.3153505e-03   1.88e-04     0.0     128       0
   79  1.1883407e-02  2.7729287e-02   1.42e-03     0.0     104       0
   80  1.6660828e-02  9.0328990e-02   4.72e-03    -0.3     112       0
   81  1.2929644e-02  4.2617808e-02   2.15e-03     0.0     145       0
   82  1.1650619e-02  6.1436912e-03   4.00e-04     0.0     107       0
   83  1.1515317e-02  9.0066592e-04   1.25e-04     0.0     110       0
   84  1.1411576e-02  9.5980588e-04   1.29e-04     0.0     111       0
   85  1.0991582e-02  8.6779868e-03   4.93e-04     0.0     115       0
   86  1.1351050e-02  2.4043758e-02   1.31e-03    -0.3     115       0
   87  1.0899307e-02  6.1357867e-03   3.70e-04     0.0     116       0
   88  1.0821518e-02  9.0691790e-04   1.21e-04     0.0     115       0
   89  1.0794383e-02  8.7352572e-04   1.17e-04     0.0     116       0
   90  1.0535073e-02  1.7576416e-03   1.63e-04     0.0     115       0
   91  1.0612618e-02  1.6911813e-02   8.90e-04    -0.3     115       0
   92  1.0575253e-02  1.4281127e-02   8.08e-04    -0.3     111       0
   93  1.0341900e-02  1.9137138e-03   1.61e-04     0.0     112       0
   94  1.0309458e-02  7.9950907e-04   1.10e-04     0.0     113       0
   95  1.0270151e-02  8.0955542e-04   1.10e-04     0.0     113       0
   96  7.3116076e-03  8.6510111e-03   4.68e-04     0.0     103       0
   97  8.4226735e-03  3.1887547e-02   1.69e-03    -0.3     105       0
   98  7.5866463e-03  1.6431691e-02   8.48e-04     0.0      99       0
   99  7.2334077e-03  2.4120444e-03   1.76e-04     0.0     100       0
  100  7.1909578e-03  4.8594417e-04   7.41e-05     0.0     100       0

 ERROR EXIT -- Too many iterations

 Products with A     :     144        Total time   (secs) :     0.3
 Products with A'    :     101        Project time (secs) :     0.1
 Newton iterations   :       0        Mat-vec time (secs) :     0.1
 Line search its     :      94        Subspace iterations :       0

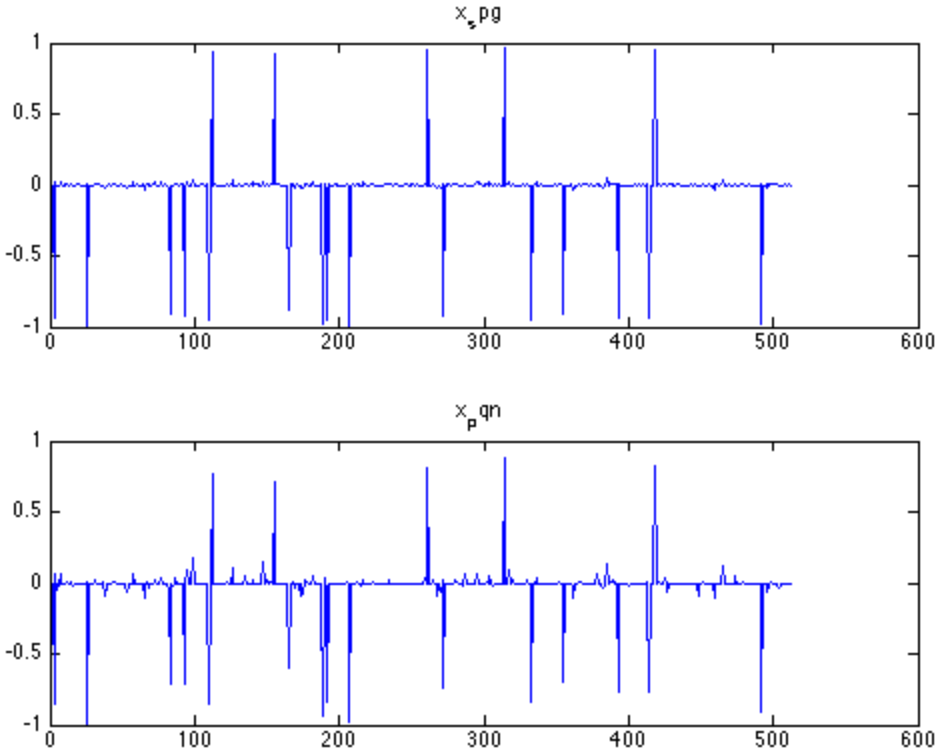

 ================================================================================
 PQNL1_SLIM v. 46  (Tue, 14 Jun 2011) based on v.1017
 ================================================================================
 No. rows              :      500      No. columns           :      512
 Initial tau           : 2.00e+01      Two-norm of b         : 3.18e-01
 Optimality tol        : 1.00e-04      Target one-norm of x  : 2.00e+01
 Basis pursuit tol     : 1.00e-06      Maximum iterations    :      100

  Iter      Objective   Relative Gap      gNorm   stepG    nnzX    nnzG
     0  3.1766730e-01  1.7725628e+00   8.86e-02     0.0       0       0
Inside of minConf_PQN
 Iteration   FunEvals Projections     Step Length          rNorm2        O
         1          1           4     1.00000e+00     2.58863e-01     1.321
         2          1          15     1.00000e+00     2.10686e-01     3.746
```

3	1	28	1.00000e+00	2.04720e-01	3.775
4	1	66	1.00000e+00	1.45726e-01	4.308
5	1	94	1.00000e+00	1.27039e-01	2.052
6	1	131	1.00000e+00	1.16361e-01	1.398
7	1	154	1.00000e+00	1.13885e-01	1.494
8	1	194	1.00000e+00	9.96505e-02	1.157
9	1	234	1.00000e+00	8.15187e-02	3.824
10	1	282	1.00000e+00	7.29046e-02	3.675
11	1	320	1.00000e+00	6.35070e-02	3.143
12	1	390	1.00000e+00	4.95220e-02	1.916
13	1	446	1.00000e+00	3.56438e-02	1.053
14	1	490	1.00000e+00	2.65722e-02	9.432
15	1	495	1.00000e+00	2.65382e-02	8.562
16	1	500	1.00000e+00	2.65090e-02	8.205
17	1	505	1.00000e+00	2.64823e-02	7.691
18	1	510	1.00000e+00	2.64581e-02	7.426
19	1	515	1.00000e+00	2.64350e-02	7.109
20	1	520	1.00000e+00	2.64129e-02	6.999
21	1	525	1.00000e+00	2.63912e-02	6.899
22	1	530	1.00000e+00	2.63698e-02	6.826
23	1	535	1.00000e+00	2.63485e-02	6.777
24	1	540	1.00000e+00	2.63274e-02	6.711
25	1	545	1.00000e+00	2.63064e-02	6.582
26	1	550	1.00000e+00	2.62858e-02	6.559
27	1	555	1.00000e+00	2.62654e-02	6.524
28	1	560	1.00000e+00	2.62450e-02	6.495
29	1	565	1.00000e+00	2.62246e-02	6.472
30	1	570	1.00000e+00	2.62044e-02	6.446
31	1	575	1.00000e+00	2.61842e-02	6.425
32	1	580	1.00000e+00	2.61641e-02	6.395
33	1	585	1.00000e+00	2.61441e-02	6.369
34	1	590	1.00000e+00	2.61242e-02	6.348
35	1	595	1.00000e+00	2.61043e-02	6.328
36	1	600	1.00000e+00	2.60845e-02	6.286
37	1	605	1.00000e+00	2.60648e-02	6.220
38	1	610	1.00000e+00	2.60452e-02	6.199
39	1	615	1.00000e+00	2.60258e-02	6.170
40	1	620	1.00000e+00	2.60064e-02	6.146
41	1	625	1.00000e+00	2.59871e-02	6.105
42	1	630	1.00000e+00	2.59678e-02	6.085
43	1	635	1.00000e+00	2.59487e-02	6.061
44	1	640	1.00000e+00	2.59295e-02	6.043
45	1	645	1.00000e+00	2.59105e-02	6.026
46	1	650	1.00000e+00	2.58915e-02	6.007
47	1	655	1.00000e+00	2.58726e-02	5.981
48	1	660	1.00000e+00	2.58537e-02	5.964
49	1	665	1.00000e+00	2.58349e-02	5.946
50	1	670	1.00000e+00	2.58161e-02	5.927
51	1	675	1.00000e+00	2.57974e-02	5.910
52	1	680	1.00000e+00	2.57787e-02	5.894
53	1	685	1.00000e+00	2.57601e-02	5.878
54	1	690	1.00000e+00	2.57416e-02	5.862
55	1	695	1.00000e+00	2.57230e-02	5.838
56	1	700	1.00000e+00	2.57046e-02	5.821

```
      57          1         705     1.00000e+00     2.56862e-02     5.799
      58          1         710     1.00000e+00     2.56679e-02     5.771
      59          1         715     1.00000e+00     2.56496e-02     5.756
      60          1         720     1.00000e+00     2.56313e-02     5.742
      61          1         725     1.00000e+00     2.56131e-02     5.727
      62          1         730     1.00000e+00     2.55950e-02     5.710
      63          1         735     1.00000e+00     2.55769e-02     5.696
      64          1         740     1.00000e+00     2.55589e-02     5.679
      65          1         745     1.00000e+00     2.55409e-02     5.663
      66          1         750     1.00000e+00     2.55229e-02     5.649
      67          1         755     1.00000e+00     2.55050e-02     5.636
      68          1         760     1.00000e+00     2.54871e-02     5.618
      69          1         765     1.00000e+00     2.54693e-02     5.604
      70          1         770     1.00000e+00     2.54515e-02     5.591
      71          1         775     1.00000e+00     2.54338e-02     5.564
      72          1         780     1.00000e+00     2.54161e-02     5.549
      73          1         785     1.00000e+00     2.53985e-02     5.536
      74          1         790     1.00000e+00     2.53809e-02     5.524
      75          1         795     1.00000e+00     2.53633e-02     5.511
      76          1         800     1.00000e+00     2.53458e-02     5.493
      77          1         805     1.00000e+00     2.53283e-02     5.462
      78          1         810     1.00000e+00     2.53109e-02     5.450
      79          1         815     1.00000e+00     2.52935e-02     5.438
      80          1         820     1.00000e+00     2.52762e-02     5.425
      81          1         825     1.00000e+00     2.52589e-02     5.413
      82          1         830     1.00000e+00     2.52416e-02     5.402
      83          1         835     1.00000e+00     2.52244e-02     5.390
      84          1         840     1.00000e+00     2.52072e-02     5.378
      85          1         845     1.00000e+00     2.51901e-02     5.344
      86          1         850     1.00000e+00     2.51730e-02     5.329
      87          1         855     1.00000e+00     2.51559e-02     5.318
      88          1         860     1.00000e+00     2.51389e-02     5.307
      89          1         865     1.00000e+00     2.51220e-02     5.296
      90          1         870     1.00000e+00     2.51050e-02     5.282
      91          1         875     1.00000e+00     2.50881e-02     5.259
      92          1         880     1.00000e+00     2.50713e-02     5.245
      93          1         885     1.00000e+00     2.50544e-02     5.231
      94          1         890     1.00000e+00     2.50377e-02     5.221
      95          1         895     1.00000e+00     2.50209e-02     5.211
      96          1         900     1.00000e+00     2.50042e-02     5.201
      97          1         905     1.00000e+00     2.49875e-02     5.191
      98          1         910     1.00000e+00     2.49708e-02     5.181
      99          1         915     1.00000e+00     2.49542e-02     5.171
     100          1         920     1.00000e+00     2.49376e-02     5.161
  100  2.4937608e-02  3.5876528e-03   3.07e-04     0.0     143       0
ERROR EXIT -- Too many iterations

Products with A     :     102        Total time   (secs) :     2.1
Products with A'    :     102        Project time (secs) :     1.5
Newton iterations   :       0        Mat-vec time (secs) :     0.1
```



BPDN

```
%     which spgl1
%     which pqnl1_2
%     which minConf_PQN_pqnl1

end
```

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