

# Fisher-Bingham MLE

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### 0.0.1 nk\_fb\_gen\_c.gen\_c

nk\_fb\_gen\_c.gen\_c( $N$ )

:  $N$  Fisher-Bingham HGD (holonomic gradient descent) C .

Description:

, testN.c, testN.h C . testN.c , .

gcc testN.c \$OpenXM\_HOME/lib/libko\_fb.a -lgsl -lblas

.  
libko\_fb.a OpenXM/src/hgm/fisher-bingham/src/ make install . gsl .  
OpenXM/src/hgm/fisher-bingham/src/Testdata , .  
testN.h #define MULTIMIN\_FDFMINIMIZER\_TYPE gsl . testN.h #define  
ODEIV\_STEP\_TYPE gsl .

, T. Koyama, H. Nakayama, K. Nishiyama, N. Takayama, Holonomic  
Gradient Descent for the Fisher-Bingham Distribution on the  $d$ -dimensional  
Sphere, Computational Statistics (2013), <http://dx.doi.org/10.1007/s00180-013-0456-z> .

Authors; T.Koyama, H.Nakayama, K.Nishiyama, N.Takayama.

Example:

```
[1854] load("nk_fb_gen_c.rr");
[2186] nk_fb_gen_c.gen_c(1);      S^1 program .
generate test1.h
generate test1.c
1
[2187] quit;
$ emacs test1.c &
```

Write data here.

\$(OpenXM\_HOME)/src/hgm/fisher-bingham/Testdata/s1\_wind\_data.h .

```
$ gcc test1.c $OpenXM_HOME/lib/libko_fb.a -lgsl -lblas
$ ./a.out
--- snip
points = [1.11945, 3.33044, -0.469454, 0.904504, -0.770373]
values = [3.4421, 1.13891, -0.0217944, 2.28474]
grad ; 0.005644 -0.033429 -0.005644 0.045820 0.047695
norm(grad) ; 0.074535
--- snip

, points parameter x11,x12,x22,y1,y2 .
Value 3.4421 , .
```

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