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=====
C SUBROUTINE ToTruncatedG      :
C   Transform X from Gaussian space to truncated Gaussian space to avoid singular geometry
C   A : THE DISTANCE BETWEEN TRUNCATED POINT AND MEAN
C   =====
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SUBROUTINE ToTruncatedG(X, A, XT)
1 IFLAG_DIST)
C   SUBROUTINE ToTruncatedG(X, A, XT)
C   A IS THE DISTANCE BETWEEN TRUNCATED POINT AND MEAN

USE ERFI_INT
USE ERF_INT
USE UMACH_INT
INCLUDE "link_fnl_shared.h"
C   IMPLICIT NONE
   DOUBLE PRECISION XXMU_IN(200), XXSIG_IN(200)
   DOUBLE PRECISION X(20),XT(20), A(20), TA(20), TB(20),XSIG(20),
1   PHI_A(20), PHI_B(20), RTMP, RTMP2,XXMU(20),XXSIG(20)
   REAL*8 NMU(20), NSIG(20), XMU(20), SIG(20)

COMMON /SR02/ XMU,SIG, NMU, NSIG, NYQ, N

DO I=1,N
XXMU(I) = NMU(I)
XXSIG(I) = NSIG(I)
ENDDO

TA = XXMU-A
TB = XXMU+A

DO I = 1,N
RTMP = (TA(I) - XXMU(I))/(XXSIG(I)*DSQRT(2.0D0))
PHI_A(I) = 0.5D0*(1.0D0 + DERF(RTMP) )
ENDDO

DO I = 1,N
RTMP = (X(I) - XXMU(I))/(XXSIG(I)*DSQRT(2.0D0))
RTMP = 0.5D0*(1.0D0 + DERF(RTMP) )
RTMP = RTMP*(1.0D0 - 2.0D0*PHI_A(I)) + PHI_A(I)
RTMP2 = 2.0D0*RTMP -1.0D0
IF (RTMP2 .NE. 1.0D0 .AND. RTMP2 .NE. -1.0D0 ) THEN
XT(I) = DERFI(RTMP2)*XXSIG(I)*DSQRT(2.0D0) + XXMU(I)
ELSE
IF (RTMP2 .EQ. 1.0D0 ) XT(I) = TB(I)
IF (RTMP2 .EQ. -1.0D0 ) XT(I) = TA(I)
ENDIF
ENDDO

C   PRINT*, 'TA(I) = ', TA(1:9)
C   PRINT*, 'XXMU(I) = ', XXMU(1:9)
C   PRINT*, 'TB(I) = ', TB(1:9)
C

RETURN
END

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