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Language : Fortran

Library: MATHLIB
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Fitting Chisquare and Likelihood Functions

OBSOLETE

Please note that this routine has been obsoleted in CNL 211. Users are advised not to use it any longer and to replace it in older programs. No maintenance for it will take place and it will eventually disappear.

Suggested replacement: `LEAMAX` (D501)

`FUMILI` minimizes the objective functions $\chi^2/2$ and ML defined by:

$$\frac{1}{2}\chi^2 = \frac{1}{2}\sum_{j=1}^{N}\left[\frac{Y_j^* - Y(X_j^{(1)},\ldots,X_j^{(L)};A_1,\ldots,A_M)}{\Delta Y_j^*}\right]^2$$

and

$$ML = \sum_{j=1}^{N} - \ln[Y(X_j^{(1)},\ldots,X_j^{(L)};A_1,\ldots,A_M)]$$

with respect to the M parameters A where, for each j, $1 \le j \le N, Y_j^*$ is a data-point with user estimated error, $\pm\Delta Y_j$, the X_j are L co-ordinates of that point and Y is a theoretical function predicting Y_j^* for a given set of X_j and A.

The method makes use of a particular property concerning the dependence of the objective function ($\chi^2/2$ or ML) on the theoretical function (Y) for faster convergence.

Structure:

`SUBROUTINE` subprograms
User Entry Names: `FUMILI`, `LIKELM`, `ERRORF`
Internal Entry Names: `ARITHM`, `D510BD`, `FUNCT`, `MCONV`, `MONITO`, `SCAL`, `SGZ`
Files Referenced: Printer
External References: User-supplied `FUNCTION` and (optional) `SUBROUTINE` subprograms
`COMMON` Block Names and Lengths: `/A/ 100`, `/AL/ 100`, `/AU/ 100`, `/DA/ 100`, `/DF/ 100`, `/ENDFLG/ 7`, `/ERROR/ 500`, `/EXDA/ 1500`, `/G/ 100`, `/NED/ 2`, `/PL/ 100`, `/PLU/ 100`, `/R/ 100`, `/SIGMA/ 100`, `/X/ 10`, `/Z/ 2485`, `/Z0/ 2485`

Usage:

See **Long Write-up**.

References:

1. Preprint YINDR-810, 1961 (Dubna) (CERN Library, preprint P. 810).

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