NAG C Library Function Document

nag_init_vavilov (g01zuc)

1 Purpose

nag_init_vavilov (g01zuc) is used to initialise functions nag_prob_density_vavilov (g01muc) and nag_prob_vavilov (g01euc).

It is intended to be used before a call to nag_prob_density_vavilov (g01muc) or nag_prob_vavilov (g01euc).

2 Specification

void nag_init_vavilov (double rkappa, double beta2, Integer mode, double *xl, double *xu, double comm_arr[], NagError *fail)

3 Description

nag_init_vavilov (g01zuc) initialises the array comm_arr for use by nag_prob_density_vavilov (g01muc) or nag_prob_vavilov (g01euc) in the evaluation of the Vavilov functions \( V_\lambda(\kappa, \beta^2) \) and \( \Phi_\lambda(\kappa, \beta^2) \) respectively.

4 References


5 Parameters

1:  \textbf{rkappa} – double  
\textit{Input}

\textit{On entry:} the argument \( \kappa \) of the function.

\textit{Constraint:} 0.01 \leq \textbf{rkappa} \leq 10.0.

2:  \textbf{beta2} – double  
\textit{Input}

\textit{On entry:} the argument \( \beta^2 \) of the function.

\textit{Constraint:} 0.0 \leq \textbf{beta2} \leq 1.0.

3:  \textbf{mode} – Integer  
\textit{Input}

\textit{On entry:} if \textbf{mode} = 0, then nag_prob_density_vavilov (g01muc) is to be called after the call to nag_init_vavilov (g01zuc). Otherwise, nag_prob_vavilov (g01euc) is to be called.

4:  \textbf{xl} – double *  
\textit{Output}

\textit{On exit:} \( x_t \), a threshold value below which \( \phi_\lambda(\lambda; \kappa, \beta^2) \) will be set to zero by nag_prob_density_vavilov (g01muc) and \( \Phi_\lambda(\lambda; \kappa, \beta^2) \) will be set to zero by nag_prob_vavilov (g01euc) if \( \lambda > x_t \).

5:  \textbf{xu} – double *  
\textit{Output}

\textit{On exit:} \( x_u \), a threshold value above which \( \phi_\lambda(\lambda; \kappa, \beta^2) \) will be set to zero by nag_prob_density_vavilov (g01muc) and \( \Phi_\lambda(\lambda; \kappa, \beta^2) \) will be set to unity by nag_prob_vavilov (g01euc) if \( \lambda > x_u \).
6: `comm_arr[322]` – double  
   `Output`
   On exit, this parameter should be passed unchanged to nag_prob_vavilov (g01euc) or nag_prob_density_vavilov (g01muc).

7: `fail` – NagError *  
   `Input/Output`
   The NAG error parameter (see the Essential Introduction).

6  Error Indicators and Warnings

**NE_REAL**

On entry, `beta2 = ⟨value⟩`.
Constraint: `beta2 ≤ 1.0`.

On entry, `beta2 = ⟨value⟩`.
Constraint: `beta2 ≥ 0.0`.

On entry, `rkappa = ⟨value⟩`.
Constraint: `rkappa ≤ 10.0`.

On entry, `rkappa = ⟨value⟩`.
Constraint: `rkappa ≥ 0.01`.

**NE_BAD_PARAM**

On entry, parameter ⟨value⟩ had an illegal value.

**NE_INTERNAL_ERROR**

An internal error has occurred in this function. Check the function call and any array sizes. If the call is correct then please consult NAG for assistance.

7  Accuracy

At least 5 significant digits are usually correct.

8  Further Comments

None.

9  Example

See Section 9 of the documents for nag_prob_density_vavilov (g01muc) and nag_prob_vavilov (g01euc).