

Bad Conditioned Linear System

The problem is to calculate the array of functions $f(x)$ defined as:

$$[A](x)\{f\}(x) = \{b\}(x)$$

and then

$$\{f\}(x) = [A]^{-1}(x)\{b\}(x)$$

Some coefficients of the matrix "A" are in the form:

$$a_{ij} = e^{-x}$$

For this reason, for large values "x" the matrix "A" becomes singular and the linear system bad conditioned.

Anyway, in double precision if "x > 706" the calculation of the coefficient gives underflow.

Matrix preconditioning seems not effective.

Are there math trick to overcome the problem?