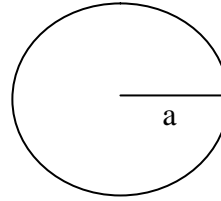


程式 86 Degenerate scale for a circular domain

$$x = \mathbf{r}_c(a \cos \mathbf{f}, a \sin \mathbf{f})$$

$$s = R_c(a \cos \mathbf{q}, a \sin \mathbf{q})$$



1. Degenerate kernel $U(s, x) = \sum X_i(x) S_i(s)$

2. $Tu_n(\mathbf{q}) = \mathbf{I}_n u_n(\mathbf{q})$

$$\mathbf{I}_n = \begin{cases} 0, & n > 0 \\ -\frac{1}{2}, & n = 0 \\ 0, & n < 0 \end{cases} \quad u_n(\mathbf{q}) = \begin{cases} \cos(n\mathbf{q}), & n > 0 \\ \frac{1}{\sqrt{2}}, & n = 0 \\ \sin(n\mathbf{q}), & n < 0 \end{cases}$$

3. $Uw_n(\mathbf{q}) = \mathbf{m}_n a w_n(\mathbf{q})$

$$\mathbf{m}_n = \begin{cases} \frac{1}{2n}, & n > 0 \\ -\log(a), & n = 0 \\ -\frac{1}{2n}, & n < 0 \end{cases}$$

where $J(\mathbf{q}) = a, w_n(\mathbf{q}) = \frac{1}{a} u_n(\mathbf{q})$

4. $Mu_n(\mathbf{q}) = \mathbf{h}_n \frac{1}{a} u_n(\mathbf{q})$

$$\mathbf{h}_n = \begin{cases} n, & n > 0 \\ 0, & n = 0 \\ -n, & n < 0 \end{cases}$$

【References】

1. G.J. Rodin and O. Steinbach, Boundary element preconditioner for problems defined on slender domains, SIAM J. Sci. Comp., Vol. 24, No.4, pp.1450-1464, 2003.