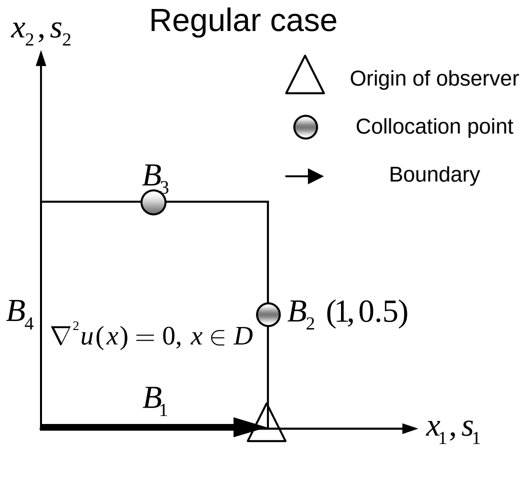
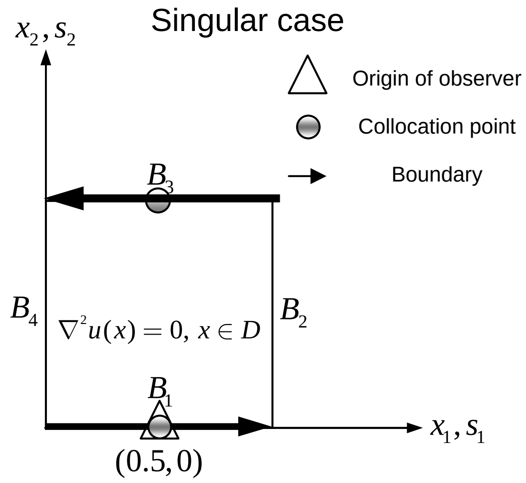
系所：________班級：__________學號：____________姓名：___________

國立台灣海洋大學河海工程研究所 BEM 2006 第 10 次作業



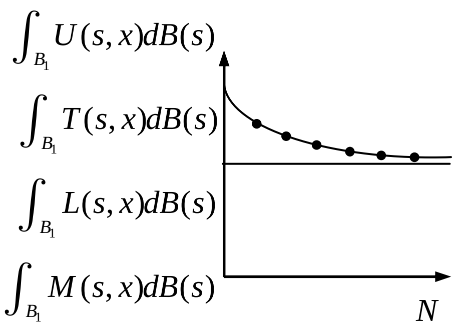


The U kernel function can be expanded into degenerate form as follows:

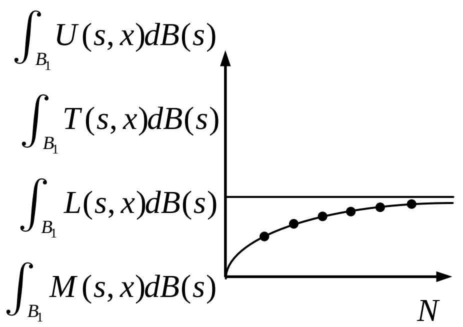
$$U(s,x) = \begin{cases} U^i(R,\theta;\rho,\phi) = \ln R - \sum_{m=1}^{\infty} \frac{1}{m} \left(\frac{\rho}{R}\right)^m \cos m(\theta-\phi),\ R > \rho \\ U^e(R,\theta;\rho,\phi) = \ln \rho - \sum_{m=1}^{\infty} \frac{1}{m} \left(\frac{R}{\rho}\right)^m \cos m(\theta-\phi),\ \rho > R \end{cases}$$

Please plot the boundary integrals of U, T, L, M kernels for constant boundary density versus number of terms.

Regular case	Singular case



where $x = (1, 0.5)$



where $x = (0.5, 0)$

Odd number:

Using Mathematica to find $U_{31}, T_{31}, L_{31}, M_{31}$

and degenerate kernel to determine $U_{33}, T_{33}, L_{33}, M_{33}$

Even number

Using degenearet kernel to find $U_{31}, T_{31}, L_{31}, M_{31}$

and Mathematica to determine $U_{33}, T_{33}, L_{33}, M_{33}$