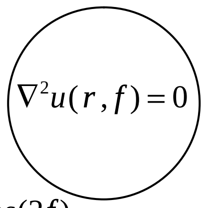
系所：________班級：__________學號：____________姓名：___________

國立台灣海洋大學河海工程研究所 BEM 2006 第 08 次作業

In the course, we derived the solution $\nabla^2 u(r,f)=0, u(1,f)=\cos(2f)$ using

$$2pu(x)=\int_B T(s,x)u(s)dB(s)-\int_B U(s,x)t(s)dB(s), x\in D$$

$$0=\int_B T(s,x)u(s)dB(s)-\int_B U(s,x)t(s)dB(s), x\to B^+\notin D$$



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

$$U(s,x)=\begin{cases} U^i(R,q;r,f)=\ln R-\sum_{m=1}^{\infty}\frac{1}{m}(\frac{r}{R})^m\cos m(q-f), R>r \\ U^e(R,q;r,f)=\ln r-\sum_{m=1}^{\infty}\frac{1}{m}(\frac{R}{r})^m\cos m(q-f), r>R \end{cases}$$

Odd number:

Using LM equation (direct LM) and UL(indirect-single layer potential approach) to rederive the solution

$$2pt(x)=\int_B M(s,x)u(s)dB(s)-\int_B L(s,x)t(s)dB(s), x\in D$$

$$0=\int_B M(s,x)u(s)dB(s)-\int_B L(s,x)t(s)dB(s), x\to B^+\notin D$$

$$u(x)=\int_{B^+} U(s,x)j(s)dB(s), x\in D$$

Even number

Using LM equation (direct LM) and TM(indirect-double layer potential approach) to rederive the solution

$$2pt(x)=\int_B M(s,x)u(s)dB(s)-\int_B L(s,x)t(s)dB(s), x\in D$$

$$0=\int_B M(s,x)u(s)dB(s)-\int_B L(s,x)t(s)dB(s), x\to B^+\notin D$$

$$u(x)=\int_{B^+} T(s,x)f(s)dB(s), x\in D$$