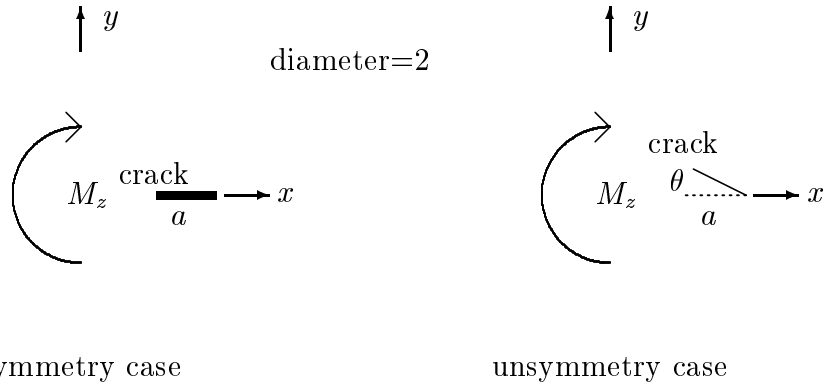


## 邊界元素法1998 第十二次作業



1. By discretizing the circular boundary with 8 elements, four elements on crack boundary with crack length  $a = 1.0$  (two on the upper crack line, the other two on the lower crack line), determine the influence coefficients for the four matrices of  $U_{ij}$ ,  $\bar{T}_{ij}$ ,  $\bar{L}_{ij}$  and  $M_{ij}$  by using DUALHAK program for  $k \rightarrow 0$  developed by MSV Lab. in NTOU. Compare the four matrices with those using BEPO2D program.

2. For the Laplace problem with  $G.E.:$   $\nabla^2 u(x_1, x_2) = 0, (x_1, x_2) \in D$   
 Substituting the boundary conditions of Dirichelet type as follows:  $BC: u(x_1, x_2) = \frac{(x_1^2 + x_2^2)}{2}$ ,  $(x_1, x_2)$  on the boundary of circle and crack into DUALHAK program, find the unknowns  $t$  on boundary and the  $u$  values in the interior.

3. Comparing the dual BEM solution with the exact solution (Set  $0 < r < 1, \phi = \pi$ )

$$u(r, \phi) = 32 \frac{a^2}{\pi} \sum_{n=0}^{\infty} \frac{\left(\frac{r}{a}\right)^{(2n+1)/2} - \left(\frac{r}{a}\right)^2}{(2n+1)[16 - (2n+1)^2]} \sin \frac{(2n+1)\phi}{2} + \frac{r^2}{2}$$

4. Plot the contour for  $u$  value in the domain using the exact solution and the dual BEM solutions from BEPO2D and DUALHAK programs.

5. Can the program DUALHAK be executed for the case of  $k = 0$  ? Why ?

## References

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