



# New Paradigm of CAE, Implicit boundary method(隱式邊界法)

台灣邁達斯  
翁嘉駿

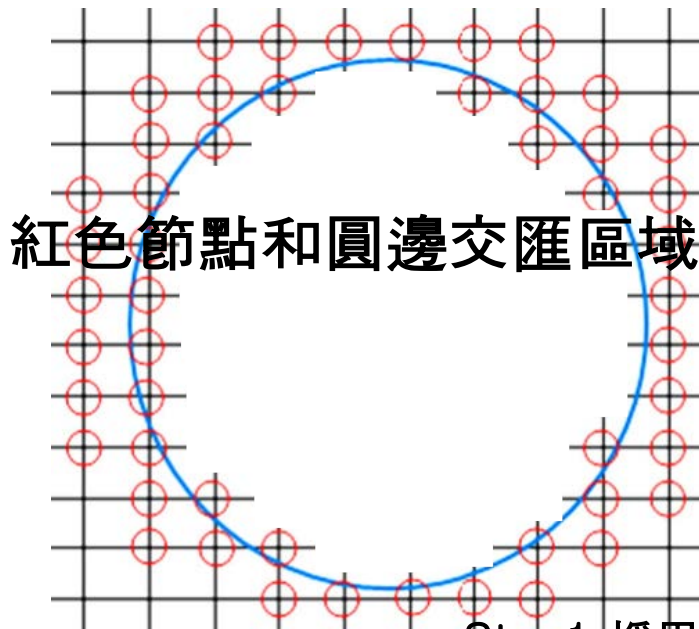
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# MeshFree- IBM (隱式邊界法)

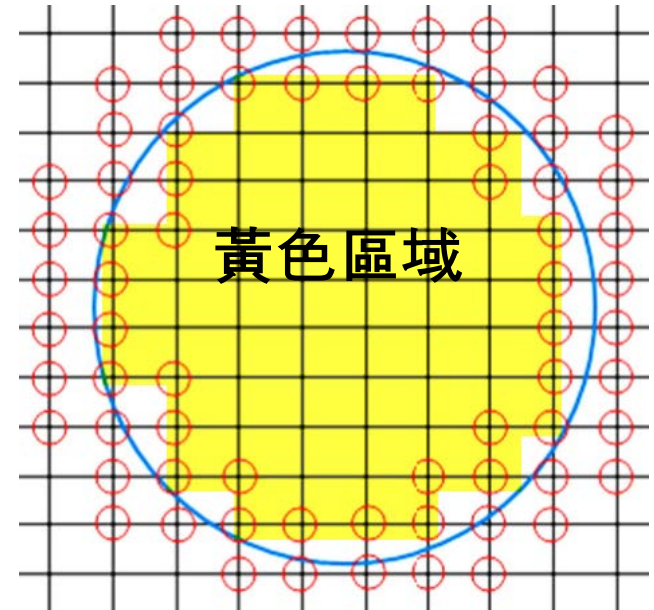
〈邊界區域採用**邊界法**〉

**BEM**



〈內部採用**擴展有限元法**〉

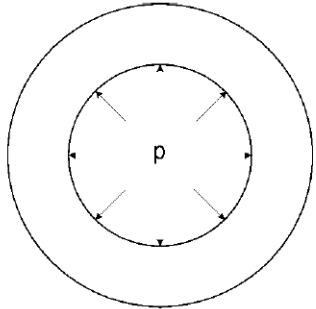
**X-FEM**



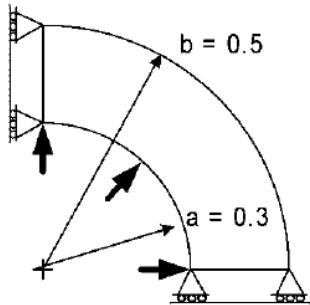
Step1. 採用近似階梯函數計算出邊界數據

Step2. 邊界數據代入X-FEM矩陣計算

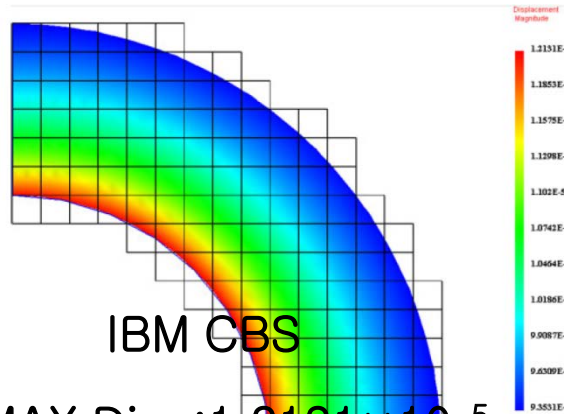
# Thick cylinder with internal pressure -IBM vs.FEM



原始模型

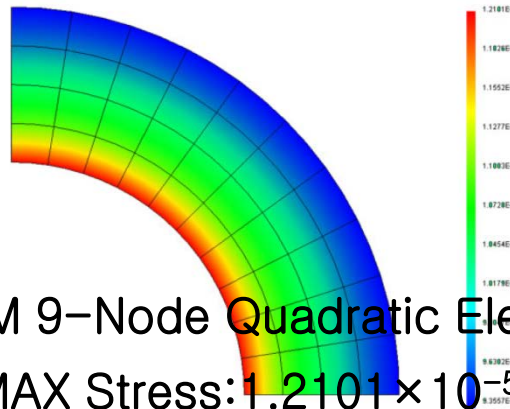


1/4對稱模型



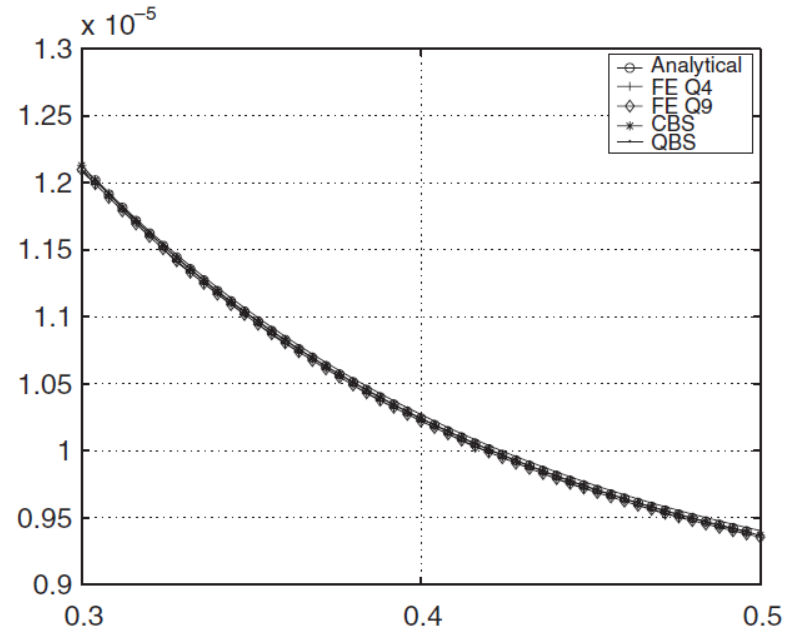
IBM CBS

MAX Disp:  $1.2131 \times 10^{-5}$



FEM 9-Node Quadratic Element

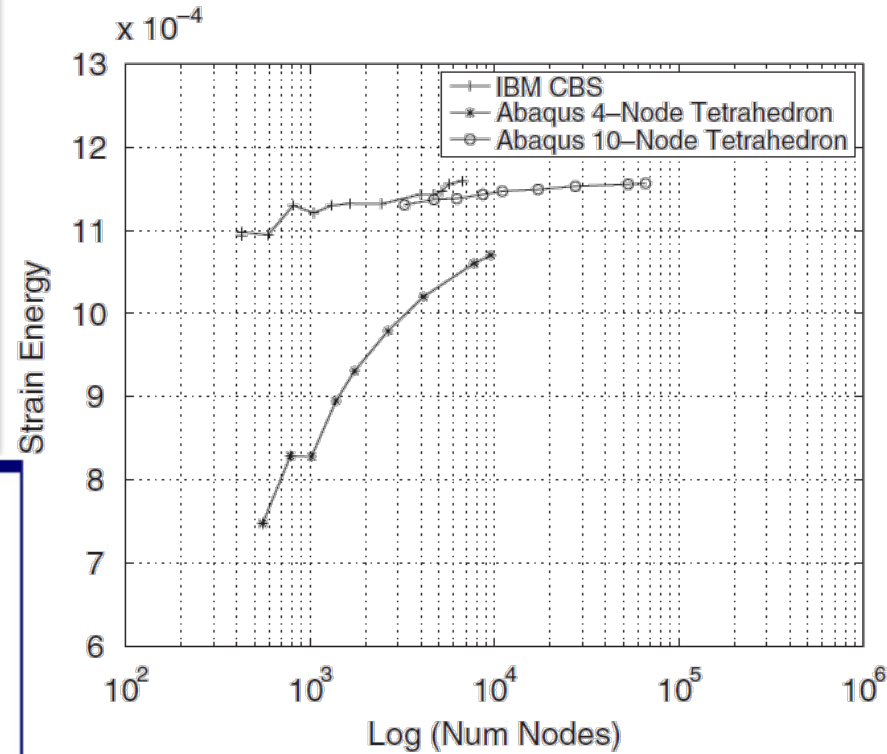
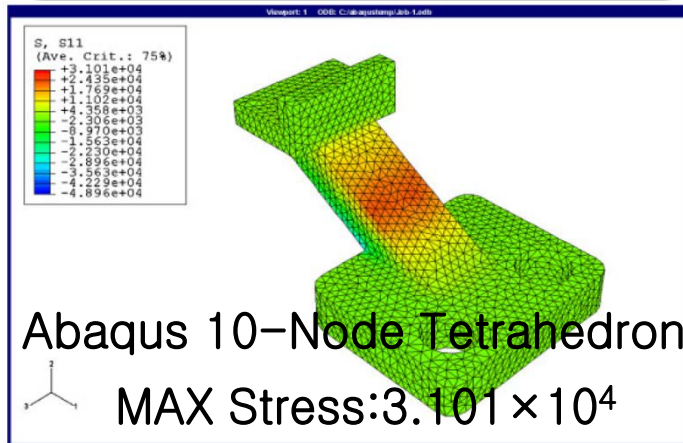
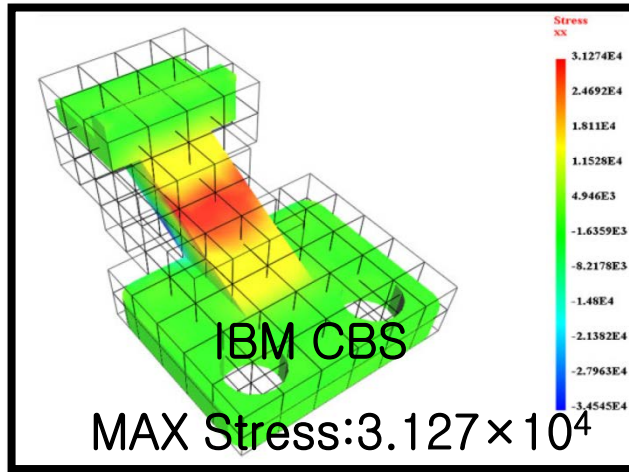
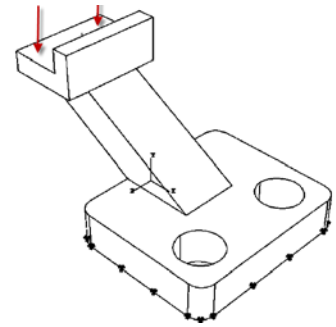
MAX Stress:  $1.2101 \times 10^{-5}$



徑向位移比較

參考文獻: Ravi K. Burla and Ashok V. Kumar. Implicit boundary method for analysis using uniform B-spline basis and structured grid. *Int. J. Numer. Meth. Engng* 2008; 76:1993-2028

# A 3D dial bracket structure-IBM vs.FEM



應變能-節點數量收斂比較

參考文獻: Ravi K. Burla and Ashok V. Kumar. Implicit boundary method for analysis using uniform B-spline basis and structured grid. *Int. J. Numer. Meth. Engng* 2008; 76:1993-2028