

圖 4-1-1 固定支承，不同厚寬比之第一模態頻率曲線圖

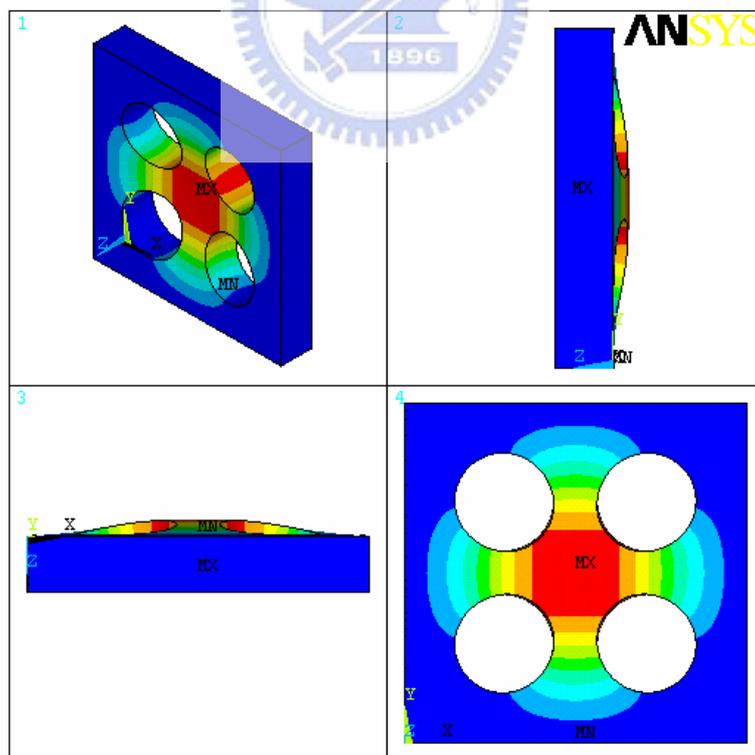


圖 4-1-2 固定支承之第一模態

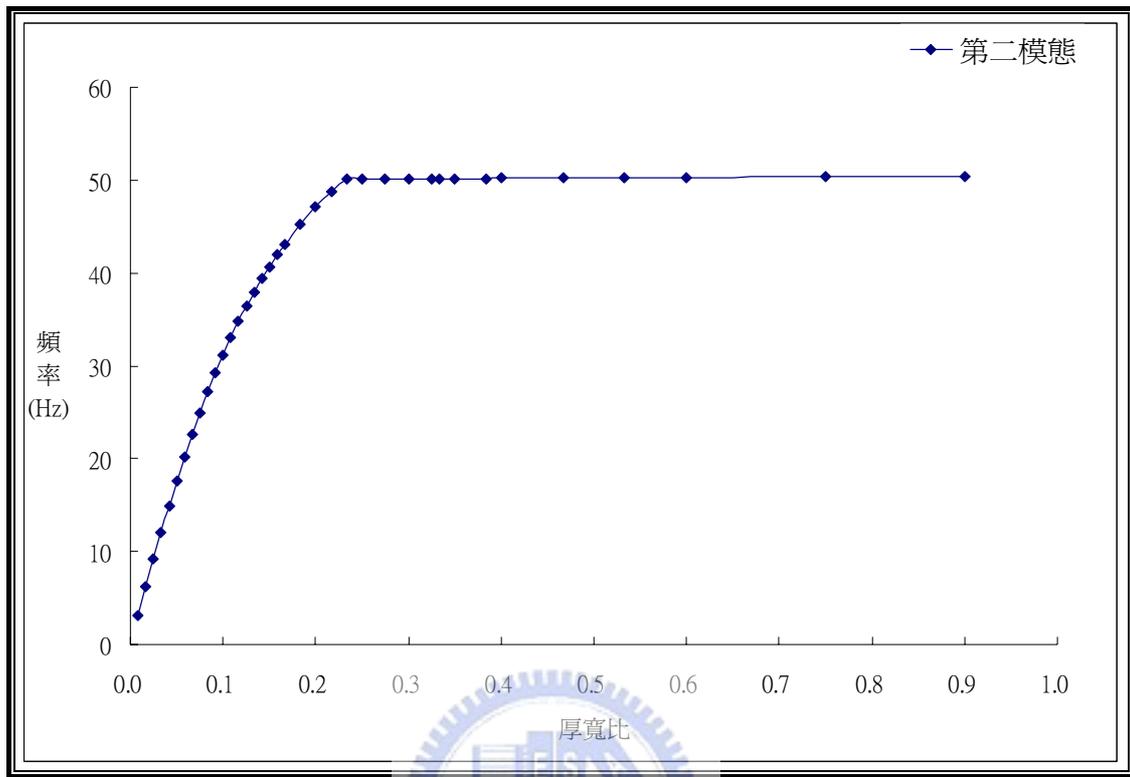


圖 4-1-3 固定支承，不同厚寬比之第二模態頻率曲線圖

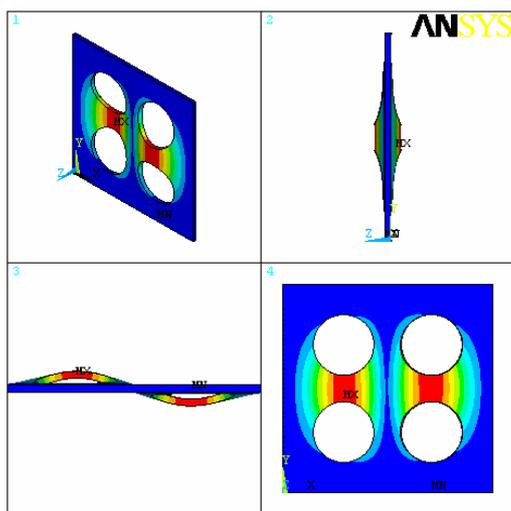


圖 4-1-4 固定支承，第二模態

厚寬比=0.025

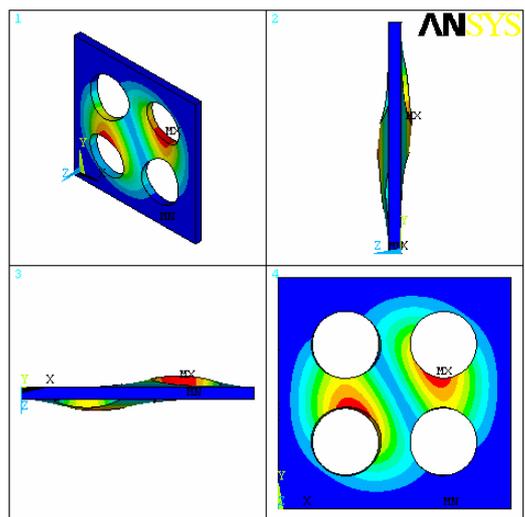


圖 4-1-5 固定支承，第二模態

厚寬比=0.050

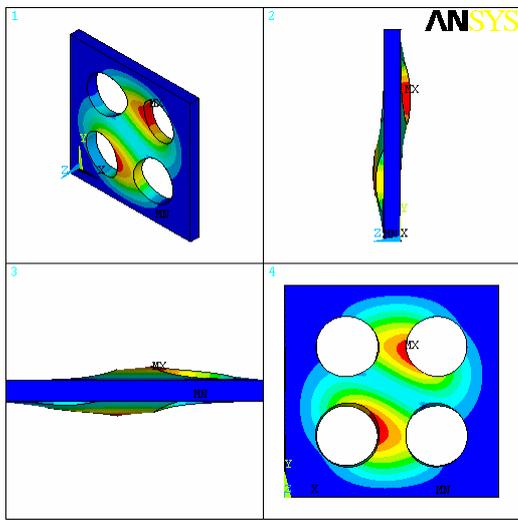


圖 4-1-6 固定支承，第二模態

厚寬比=0.075

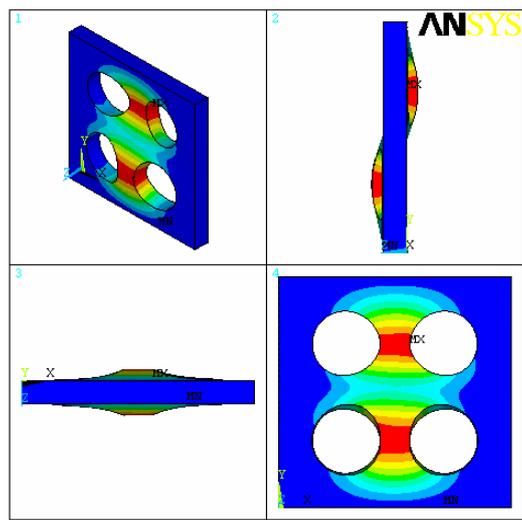


圖 4-1-7 固定支承，第二模態

厚寬比=0.100

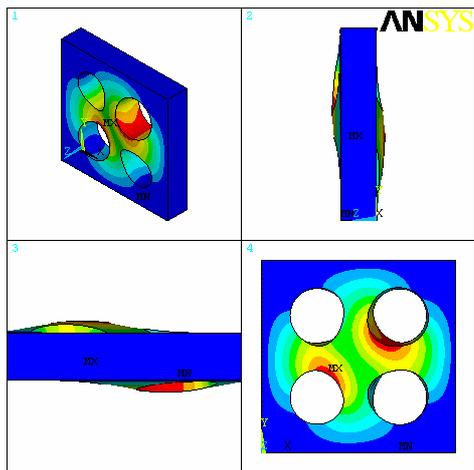
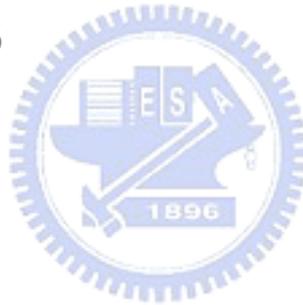


圖 4-1-8 固定支承，第二模態

厚寬比=0.233

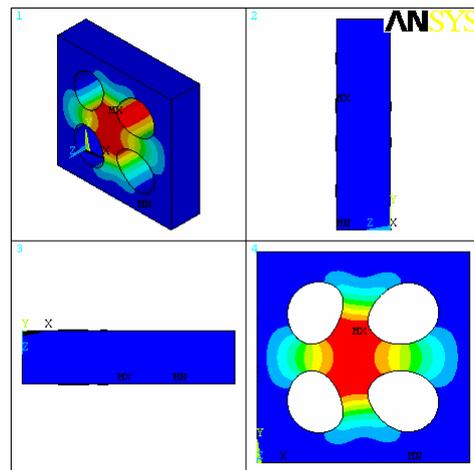


圖 4-1-9 固定支承，第二模態

厚寬比=0.250

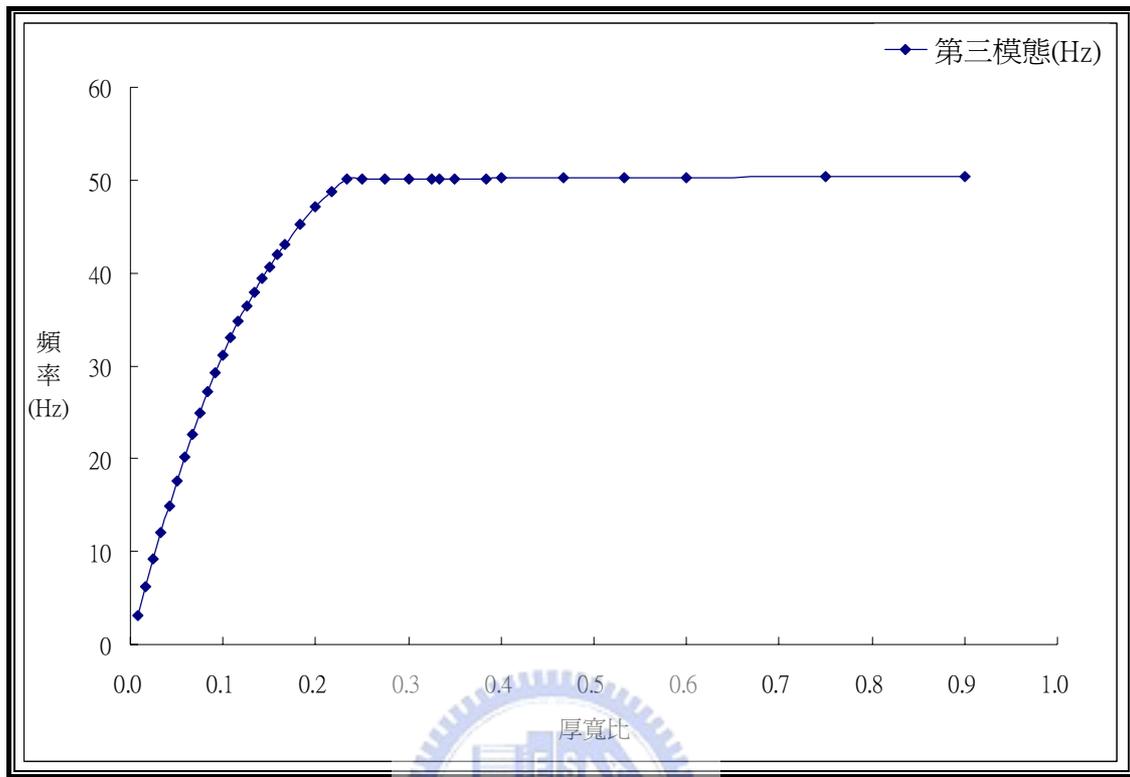


圖 4-1-10 固定支承，不同厚寬比之第三模態頻率曲線圖

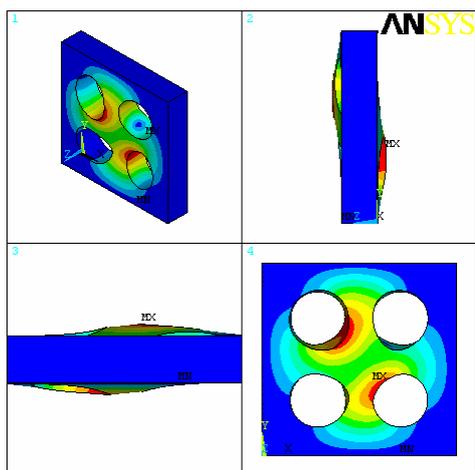


圖 4-1-11 固定支承，第三模態

厚寬比=0.233

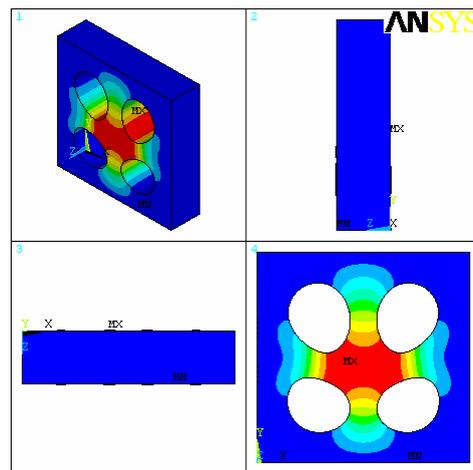


圖 4-1-12 固定支承，第三模態

厚寬比=0.250

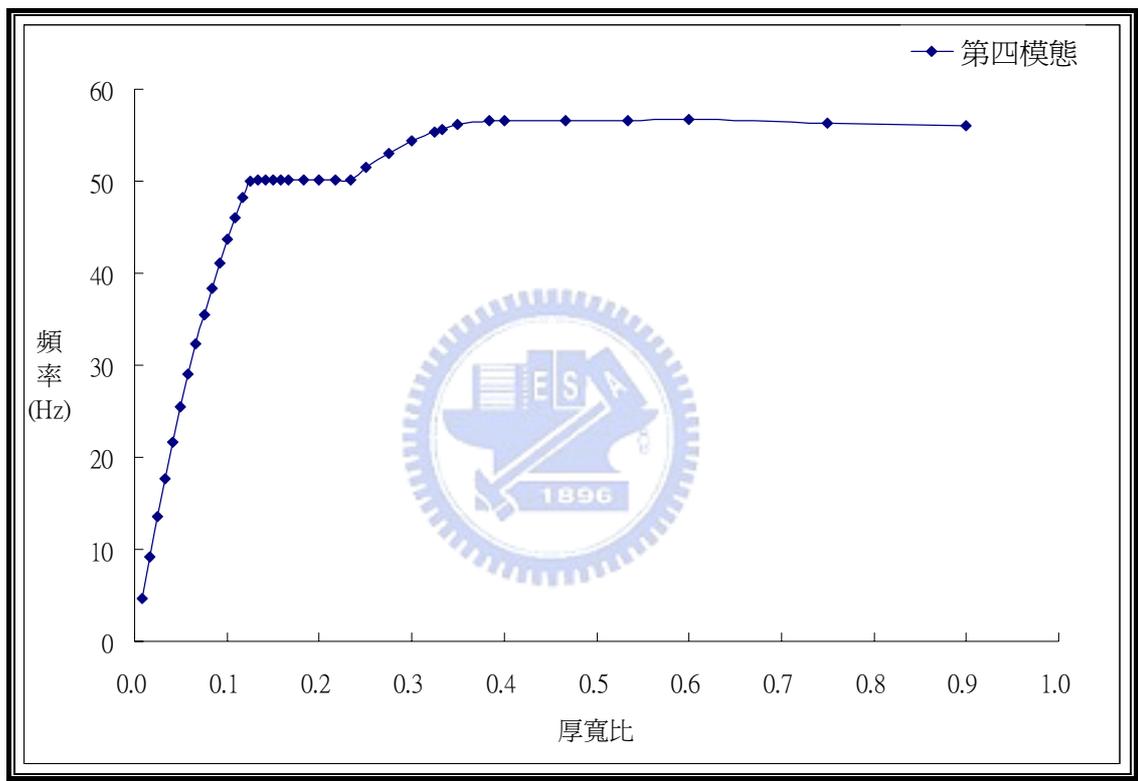


圖 4-1-13 固定支承，不同厚寬比之第四模態頻率曲線圖

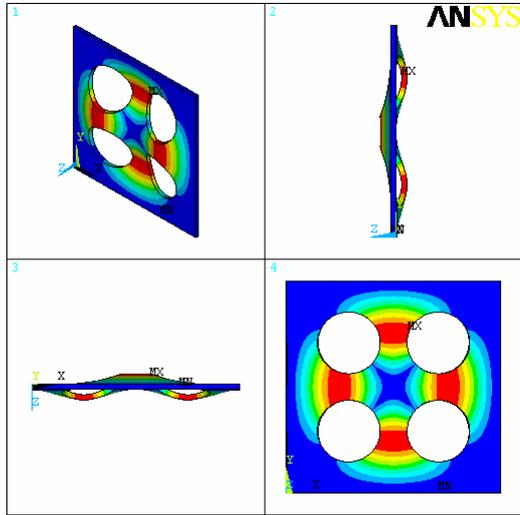


圖 4-1-14 固定支承，第四模態

厚寬比=0.025

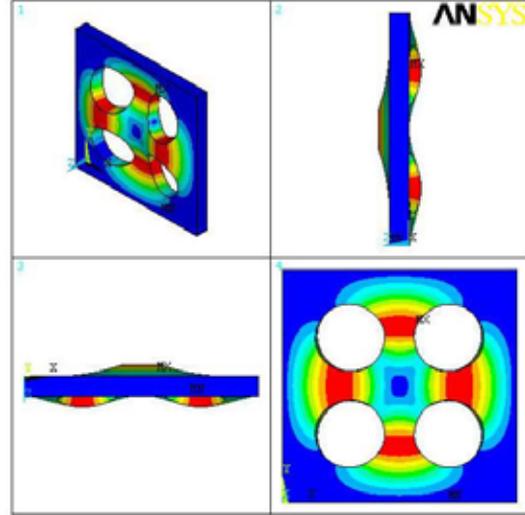


圖 4-1-15 固定支承，第四模態

厚寬比=0.083

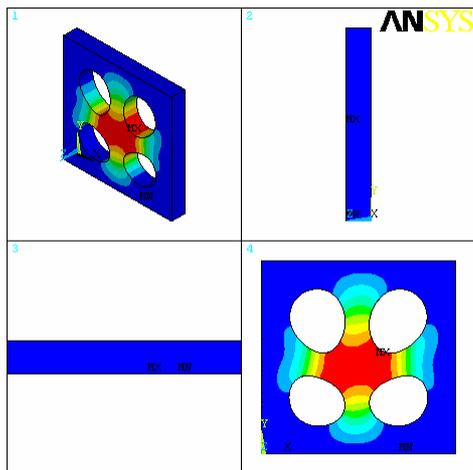


圖 4-1-16 固定支承，第四模態

厚寬比=0.125

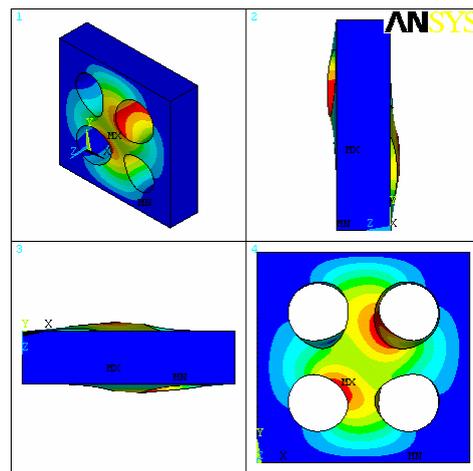


圖 4-1-17 固定支承，第四模態

厚寬比=0.250

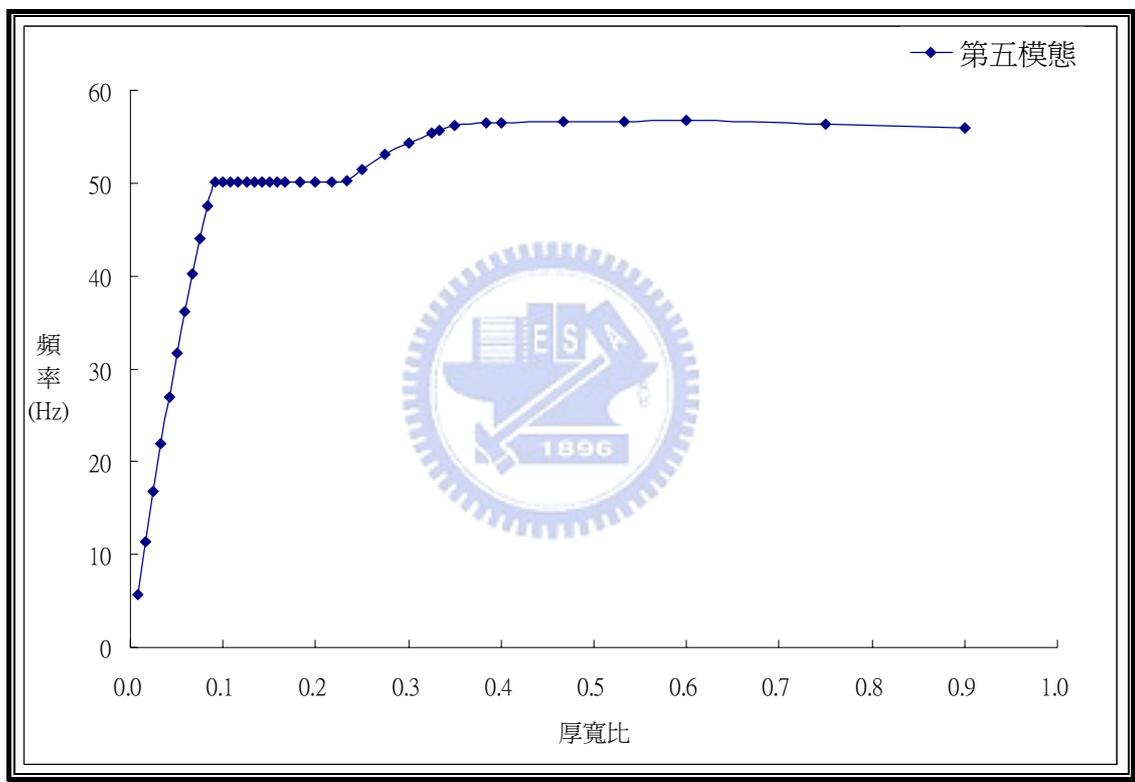


圖 4-1-18 固定支承，不同厚寬比之第五模態頻率曲線圖

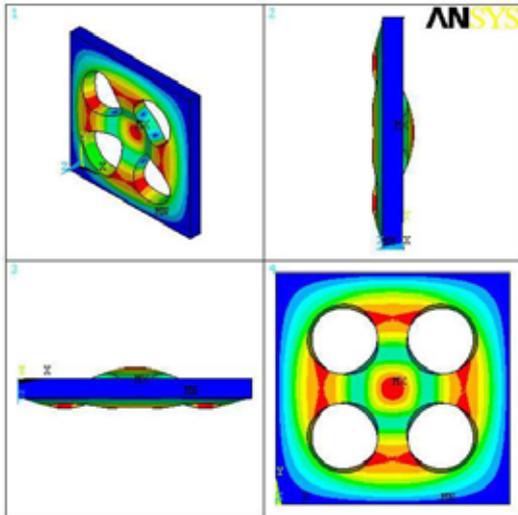


圖 4-1-19 固定支承，第五模態

厚寬比=0.083

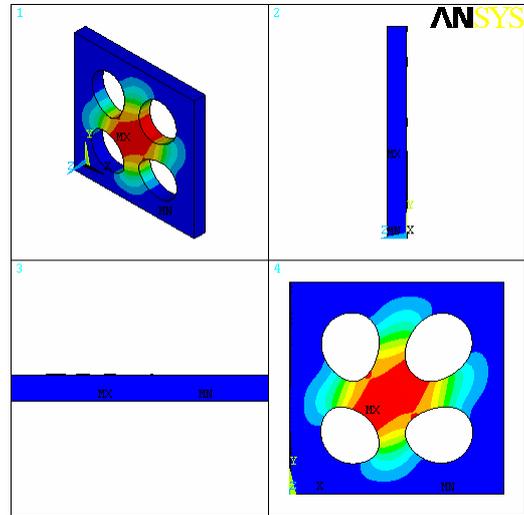


圖 4-1-20 固定支承，第五模態

厚寬比=0.092

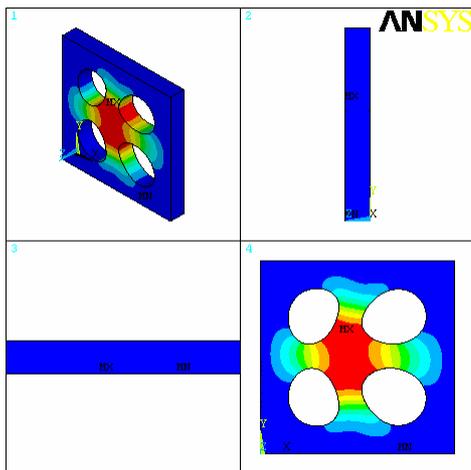


圖 4-1-21 固定支承，第五模態

厚寬比=0.125

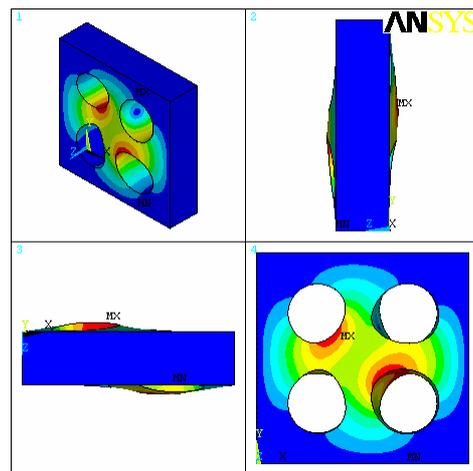


圖 4-1-22 固定支承，第五模態

厚寬比=0.250

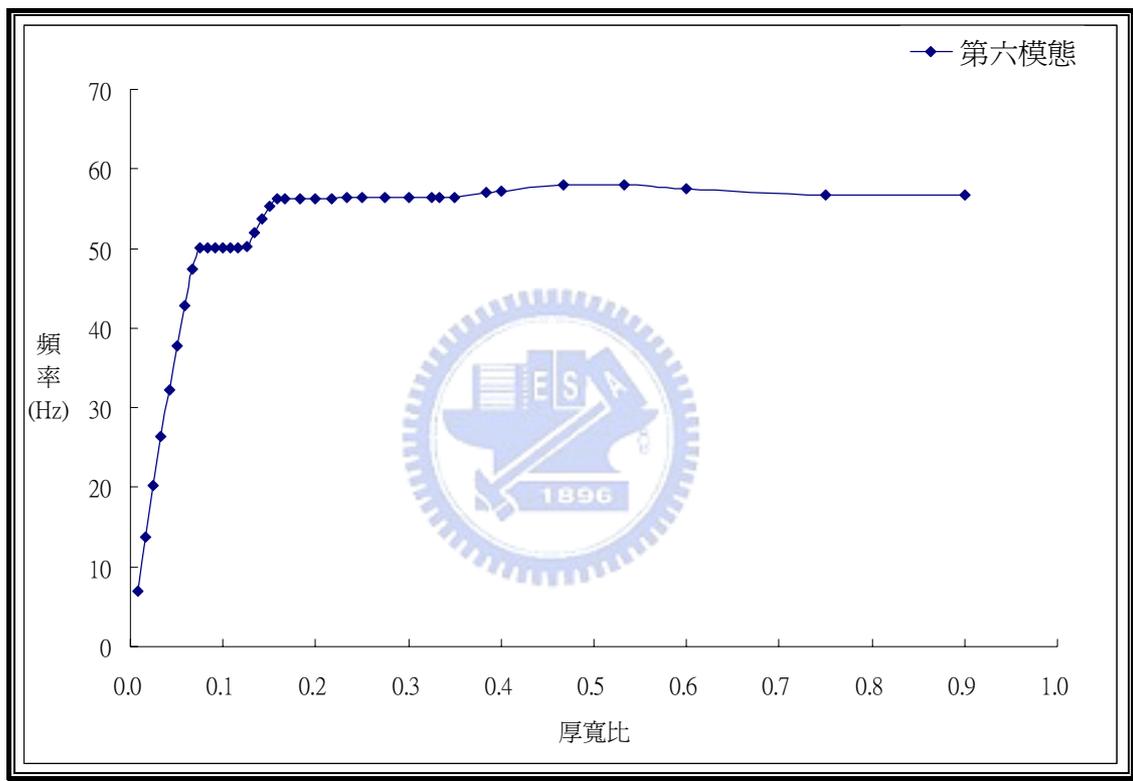


圖 4-1-23 固定支承，不同厚寬比之第六模態頻率曲線圖

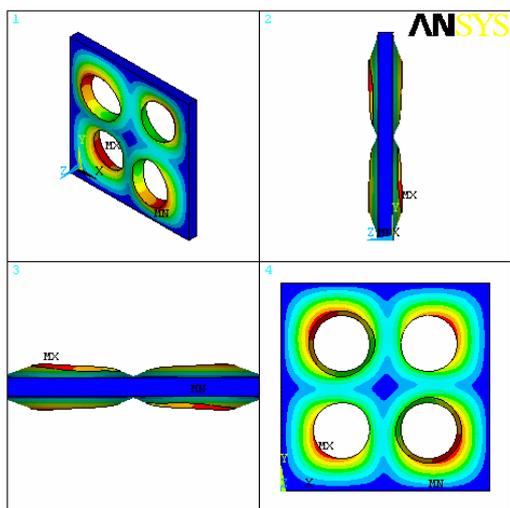


圖 4-1-24 固定支承，第六模態

厚寬比=0.067

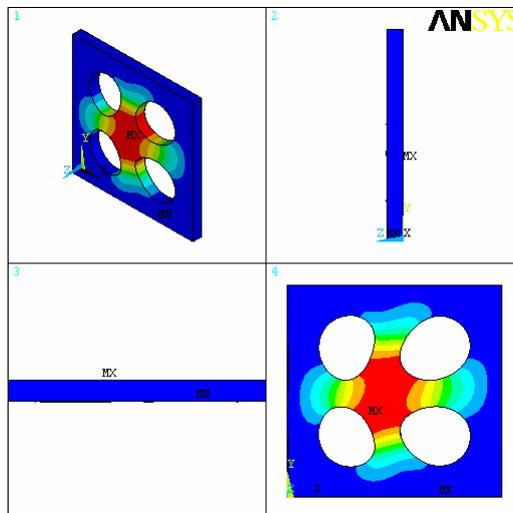


圖 4-1-25 固定支承，第六模態

厚寬比=0.075

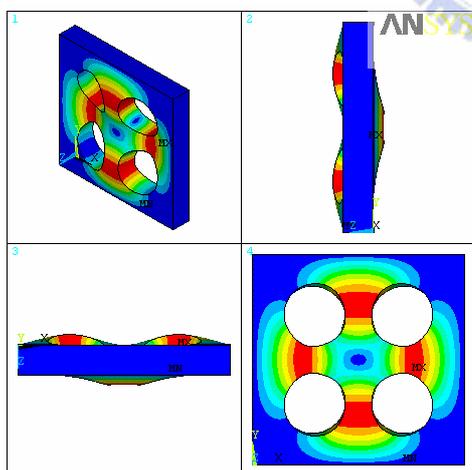


圖 4-1-26 固定支承，第六模態

厚寬比=0.133

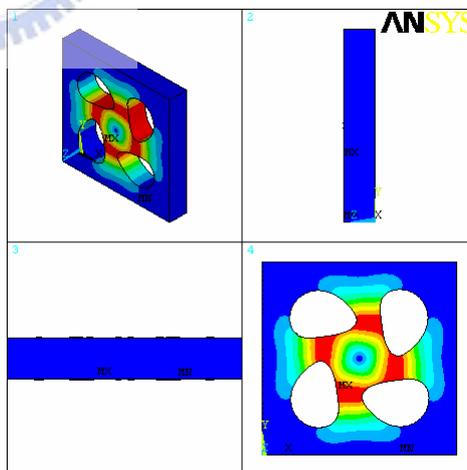


圖 4-1-27 固定支承，第六模態

厚寬比=0.158

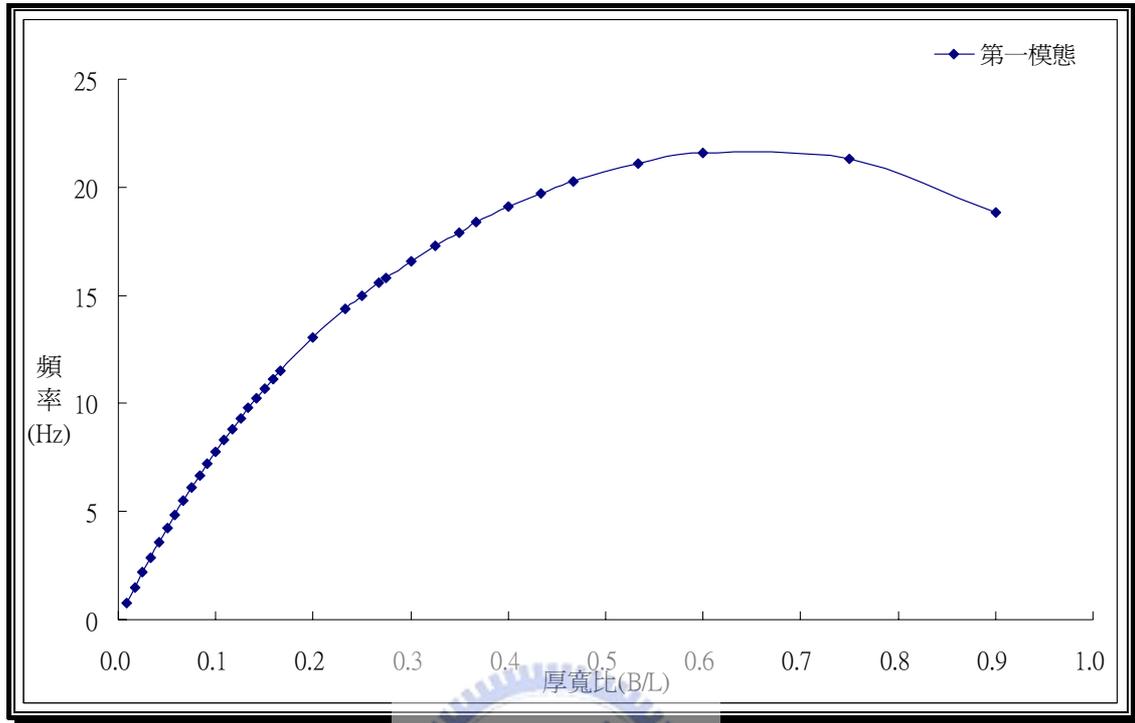


圖 4-1-28 簡支承，不同厚寬比之第一模態頻率曲線圖

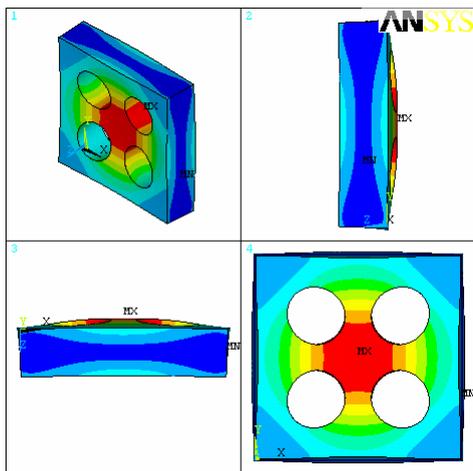


圖 4-1-29 簡支承，第一模態

厚寬比=0.233

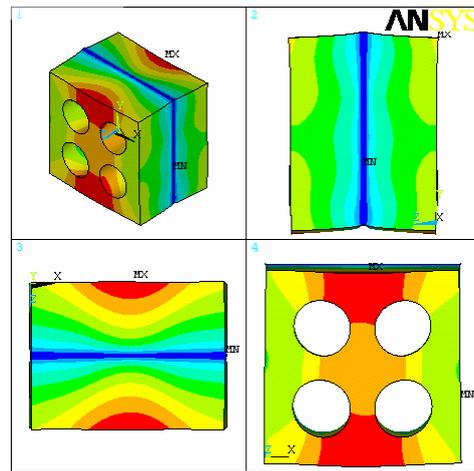


圖 4-1-30 簡支承，第一模態

厚寬比=0.75

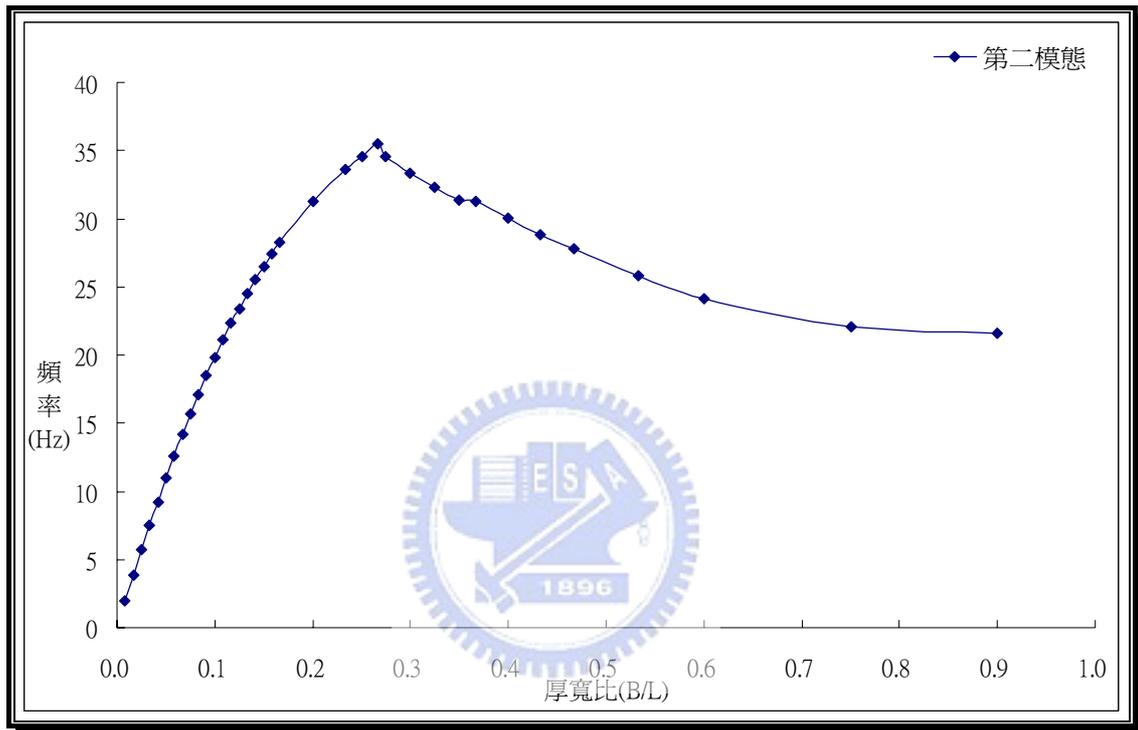


圖 4-1-31 簡支承，不同厚寬比之第二模態頻率曲線圖

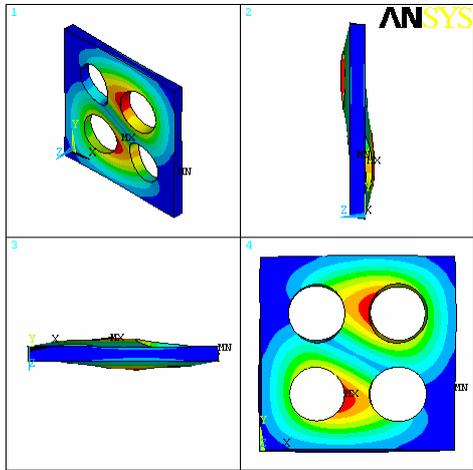


圖 4-1-32 簡支承，第二模態

厚寬比=0.075

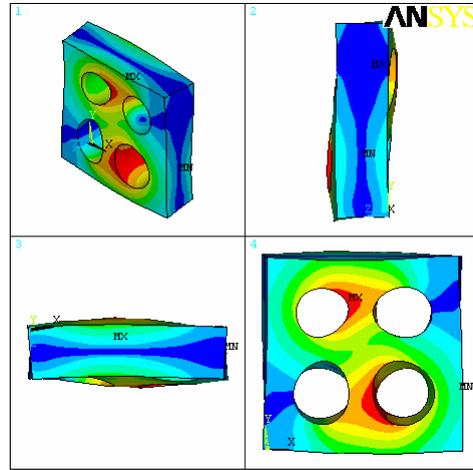


圖 4-1-33 簡支承，第二模態

厚寬比=0.267

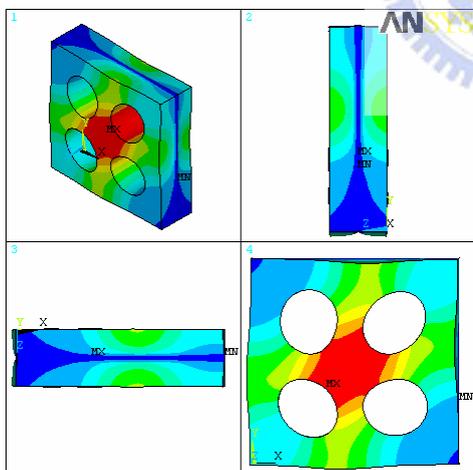


圖 4-1-34 簡支承，第二模態

厚寬比=0.275

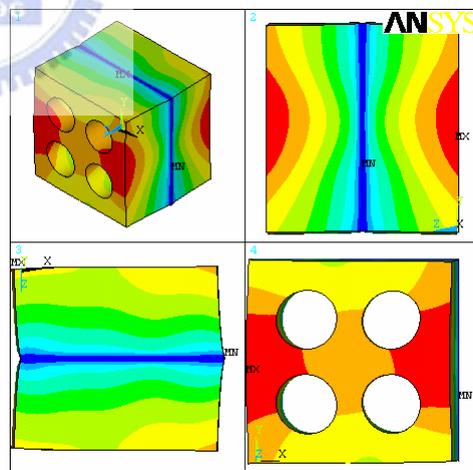


圖 4-1-35 簡支承，第二模態

厚寬比=0.9

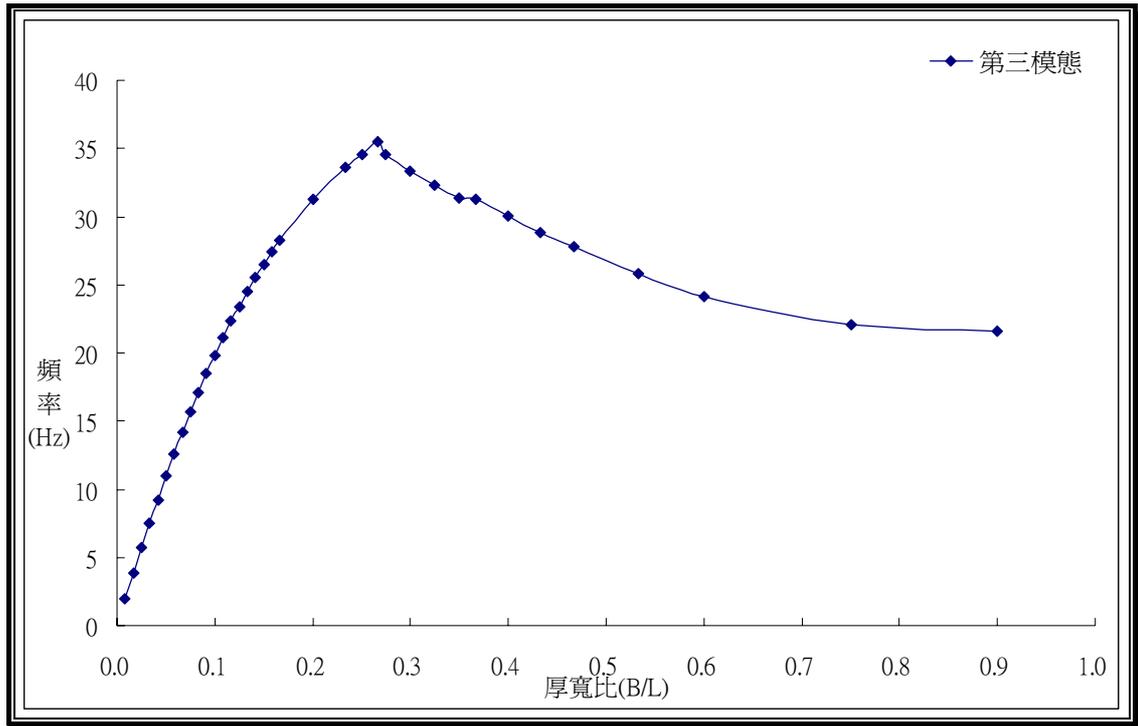


圖 4-1-36 簡支承，不同厚寬比之第三模態頻率曲線圖

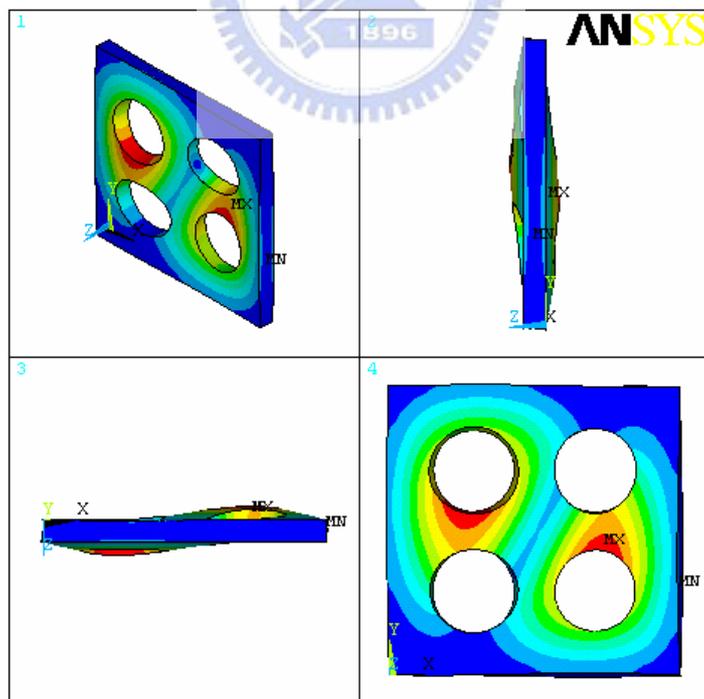


圖 4-1-37 簡支承，第三模態厚寬比=0.075

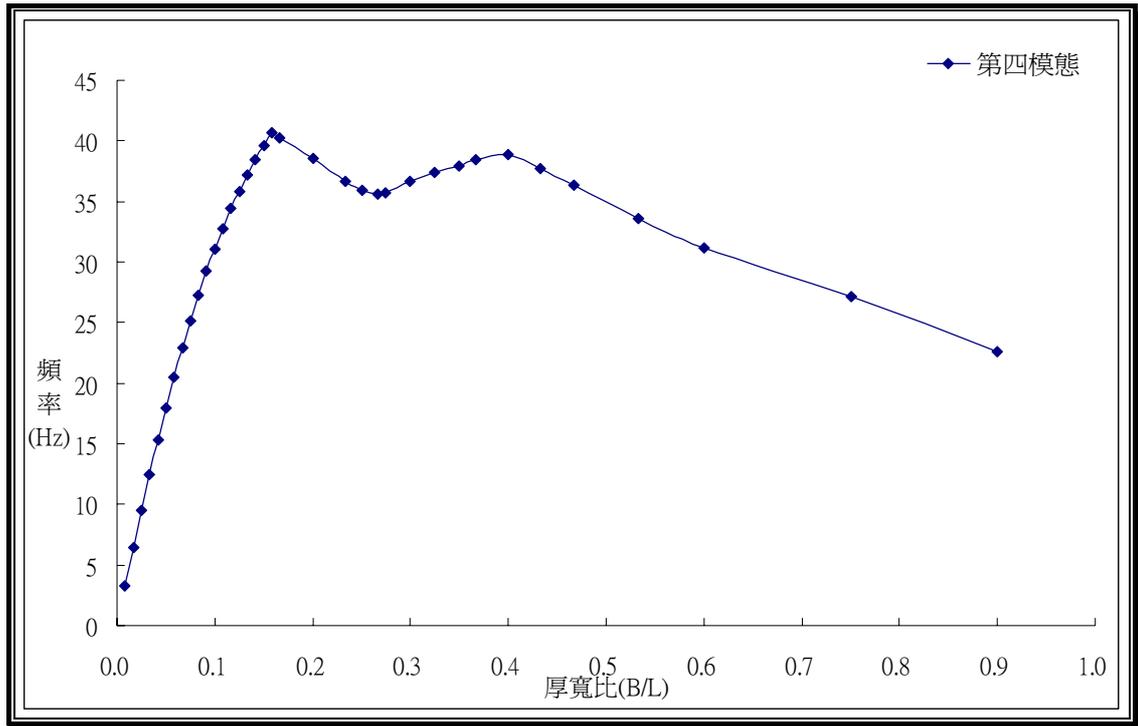


圖 4-1-38 簡支承，不同厚寬比之第四模態頻率曲線圖

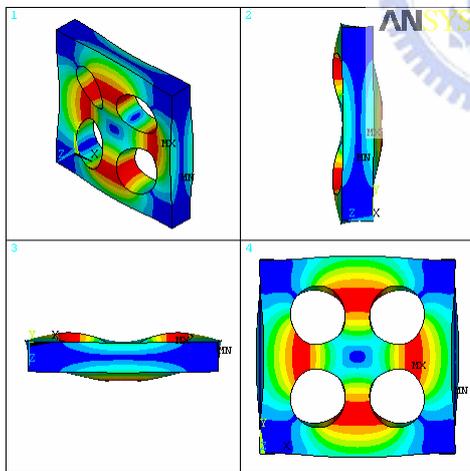


圖 4-1-39 簡支承，第四模態

厚寬比=0.158

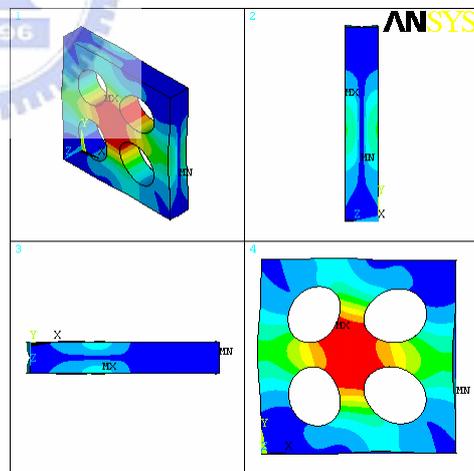


圖 4-1-40 簡支承，第四模態

厚寬比=0.167

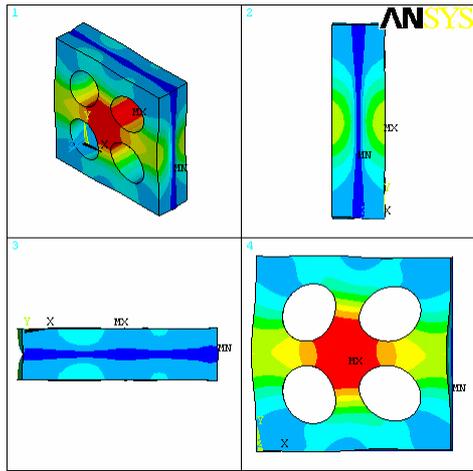


圖 4-1-41 簡支承，第四模態

厚寬比=0.267

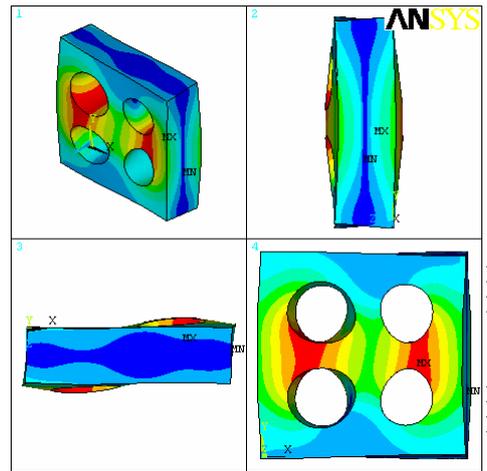


圖 4-1-42 簡支承，第四模態

厚寬比=0.275

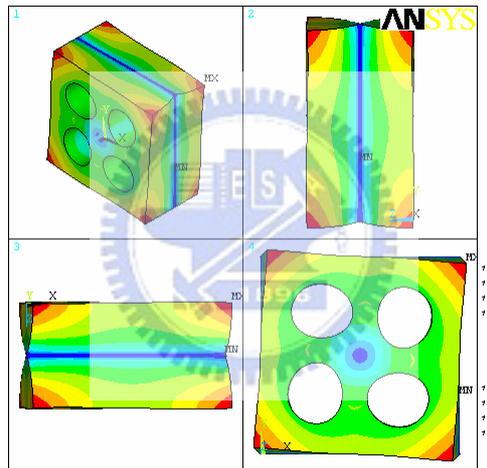


圖 4-1-43 簡支承，第四模態厚寬比=0.533

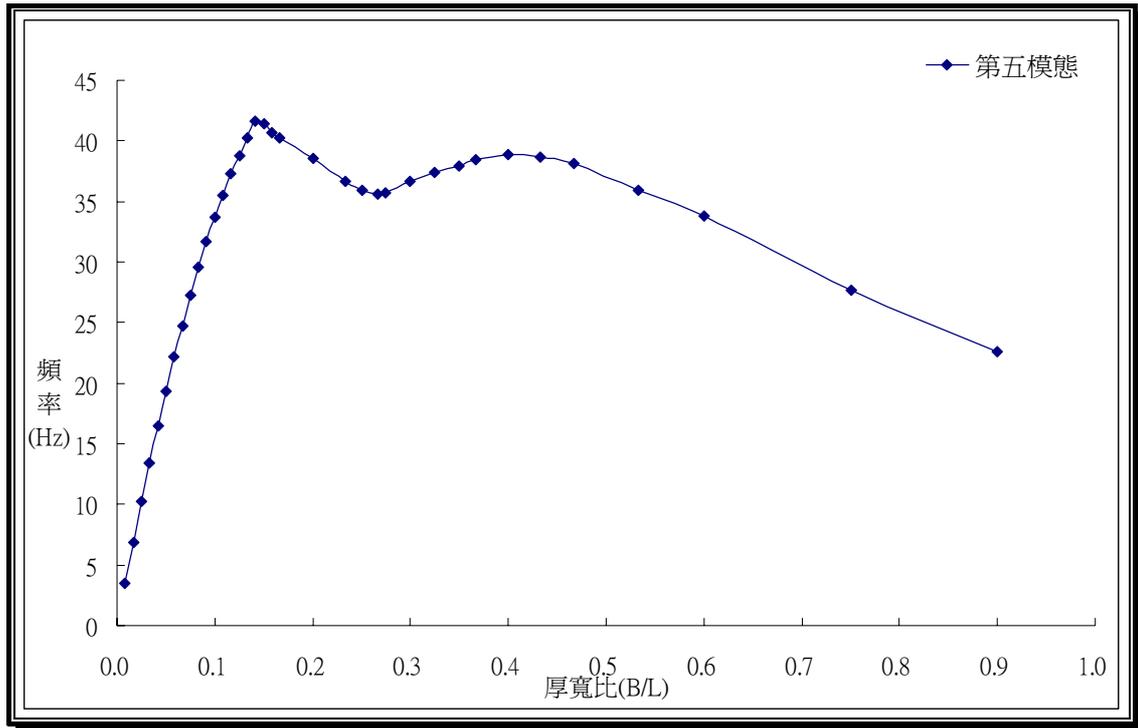


圖 4-1-44 簡支承，不同厚寬比之第五模態頻率曲線圖

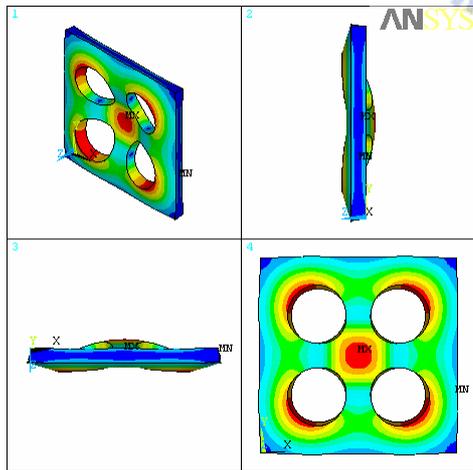


圖 4-1-45 簡支承，第五模態

厚寬比=0.075

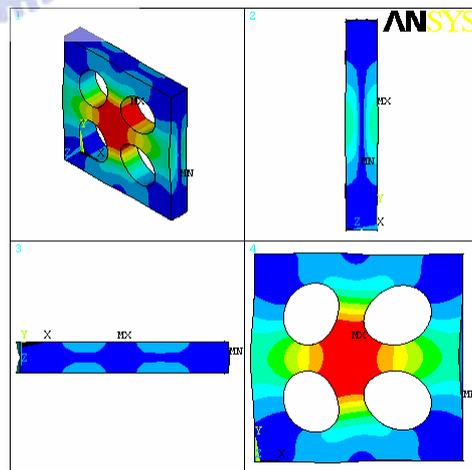


圖 4-1-46 簡支承，第五模態

厚寬比=0.150

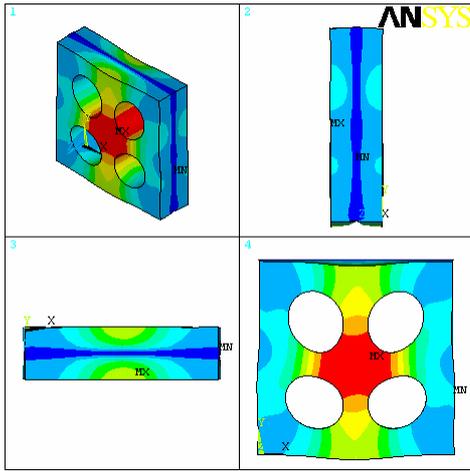


圖 4-1-47 簡支承，第五模態

厚寬比=0.267

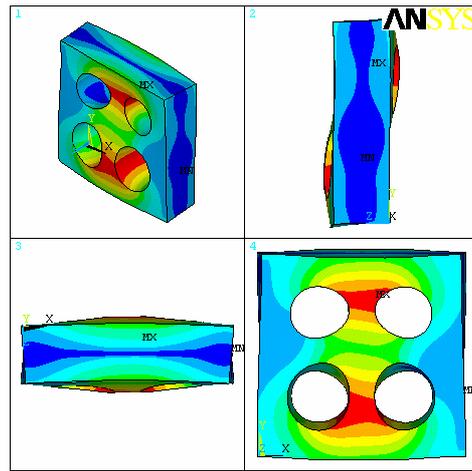


圖 4-1-48 簡支承，第五模態

厚寬比=0.275

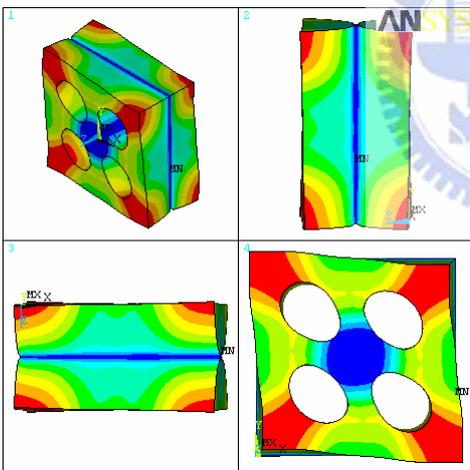


圖 4-1-49 簡支承，第五模態

厚寬比=0.533

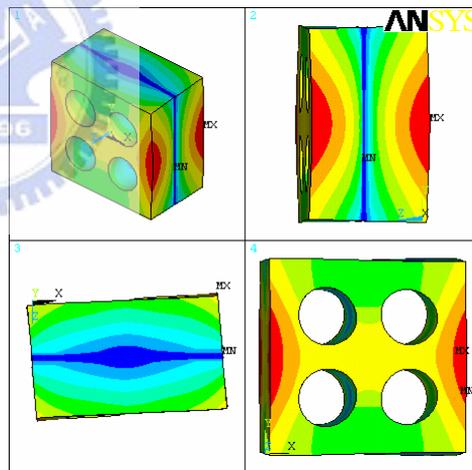


圖 4-1-50 簡支承，第五模態

厚寬比=0.600

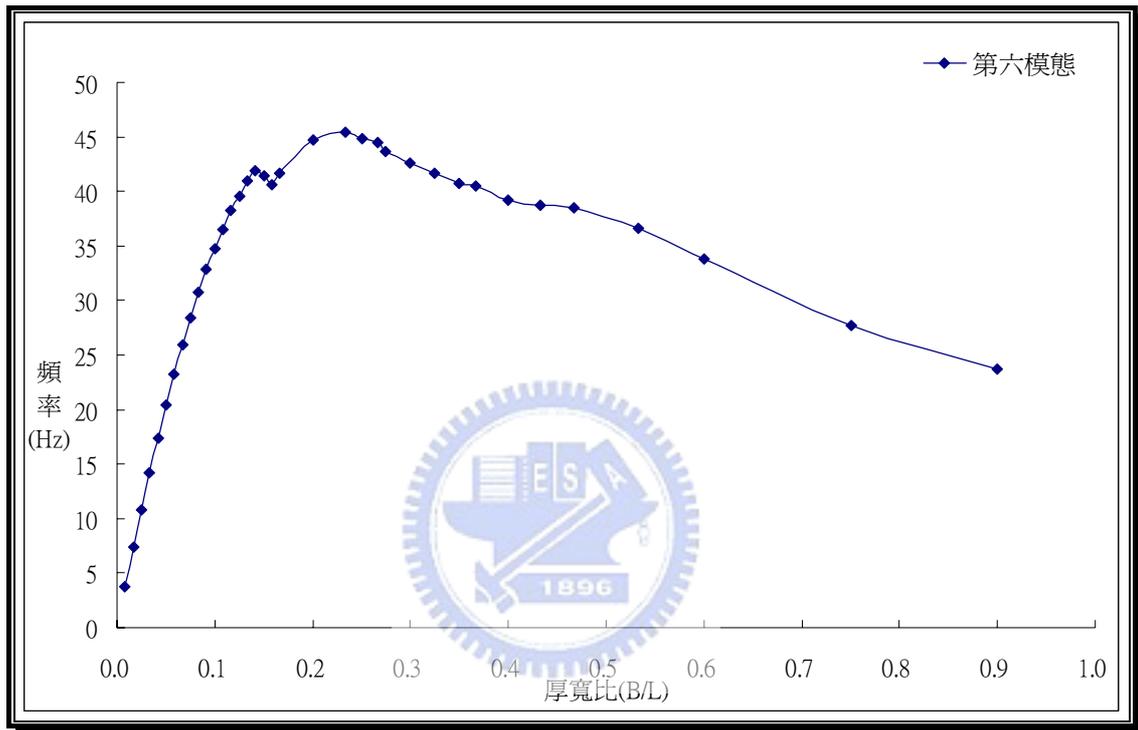


圖 4-1-51 簡支承，不同厚寬比之第六模態頻率曲線圖

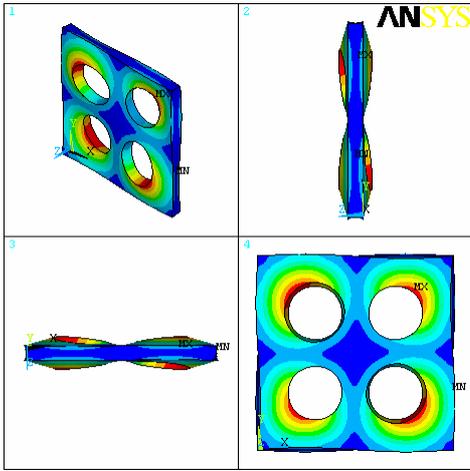


圖 4-1-52 簡支承，第六模態

厚寬比=0.075

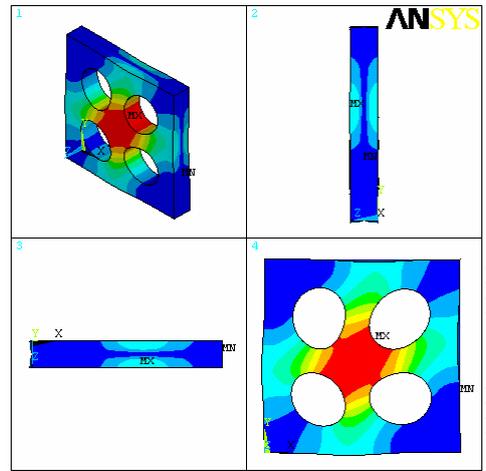


圖 4-1-53 簡支承，第六模態

厚寬比=0.142

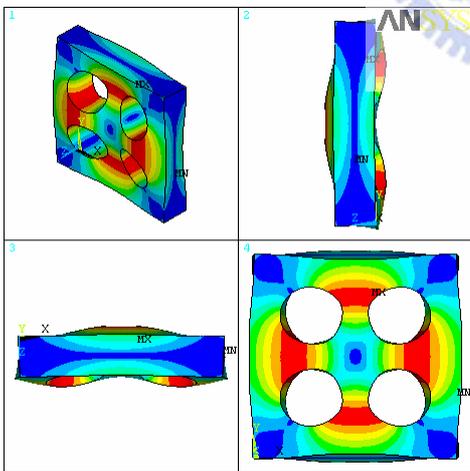


圖 4-1-54 簡支承，第六模態

厚寬比=0.2

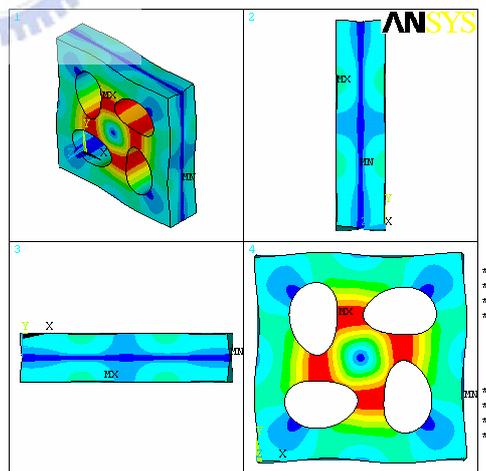


圖 4-1-55 簡支承，第六模態

厚寬比=0.233

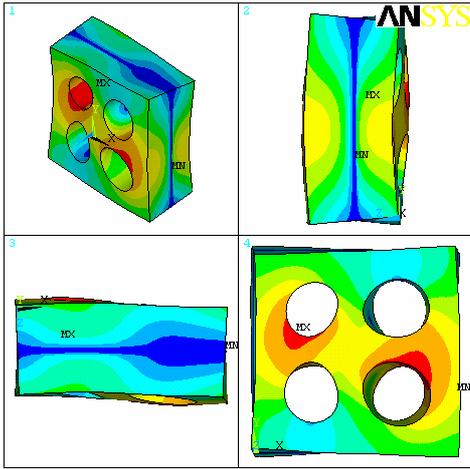


圖 4-1-56 簡支承，第六模態

厚寬比=0.433

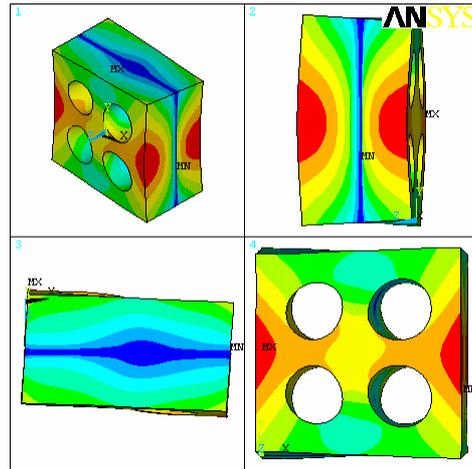


圖 4-1-57 簡支承，第六模態

厚寬比=0.533

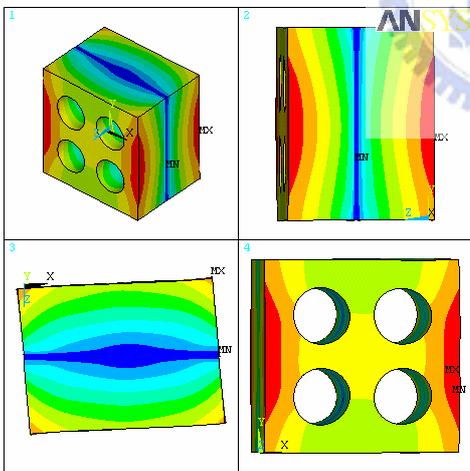


圖 4-1-58 簡支承，第六模態

厚寬比=0.75

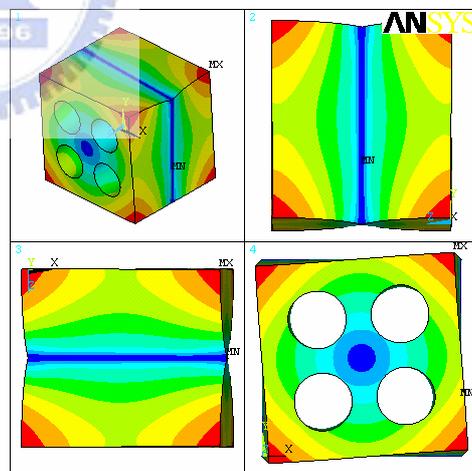


圖 4-1-59 簡支承，第六模態

厚寬比=0.90

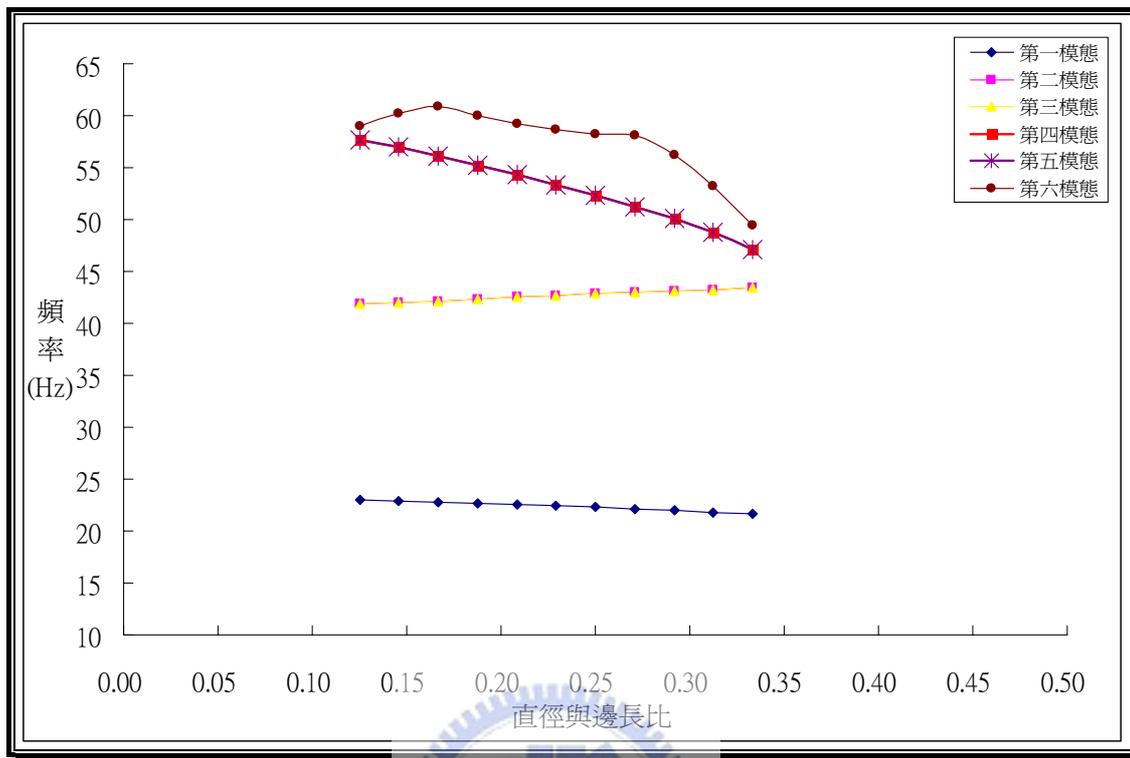


圖 4-2-1 固定支承，開孔半徑改變之模態頻率曲線圖

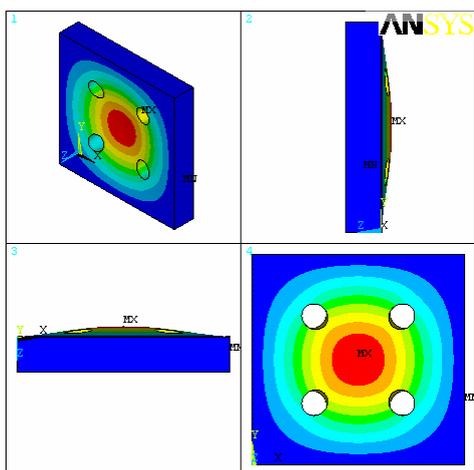


圖 4-2-2 固定支承，第一模態

$R/L=0.125$

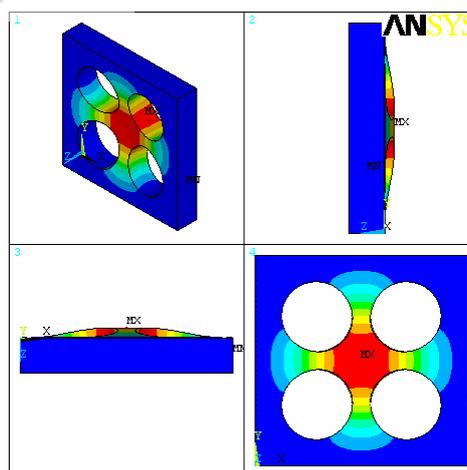


圖 4-2-3 固定支承，第一模態

$R/L=0.333$

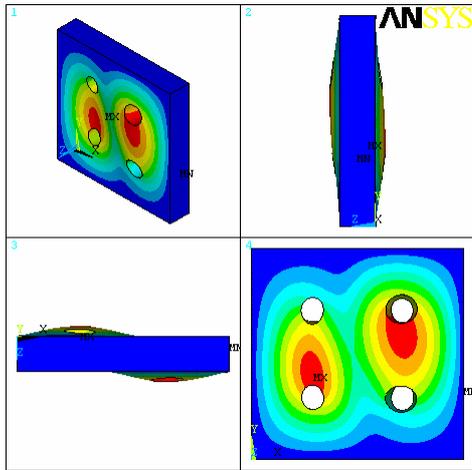


圖 4-2-4 固定支承，第二模態

$R/L=0.125$

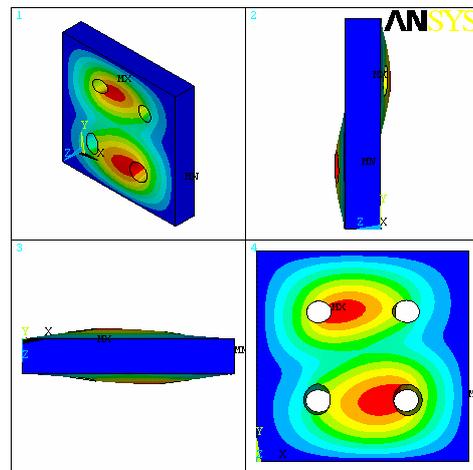


圖 4-2-5 固定支承，第三模態

$R/L=0.125$

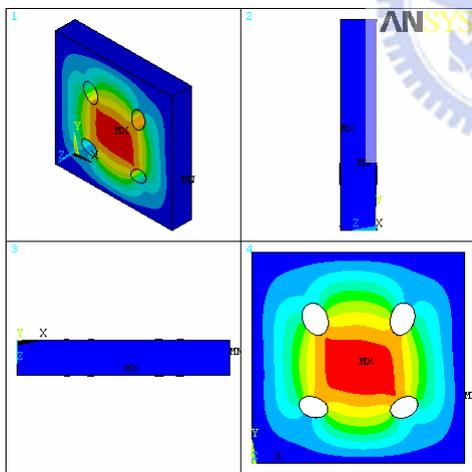


圖 4-2-6 固定支承，第四模態

$R/L=0.125$

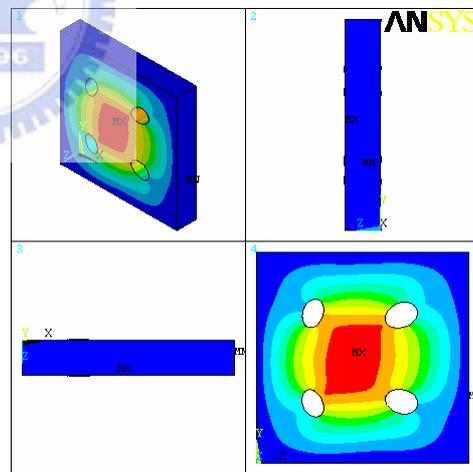


圖 4-2-7 固定支承，第五模態

$R/L=0.125$

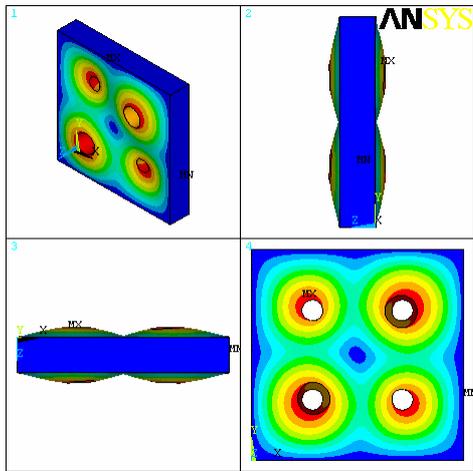


圖 4-2-8 固定支承，第六模態

$R/L=0.125$

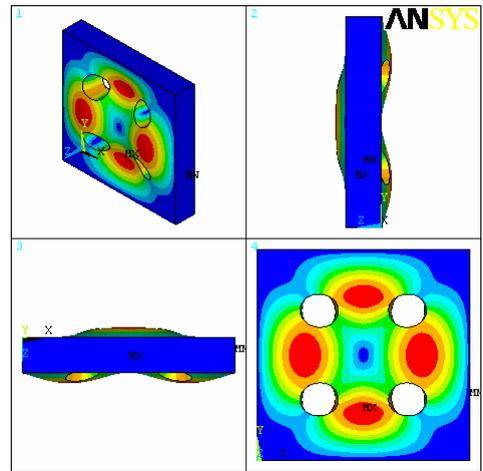


圖 4-2-9 固定支承，第六模態

$R/L=0.167$

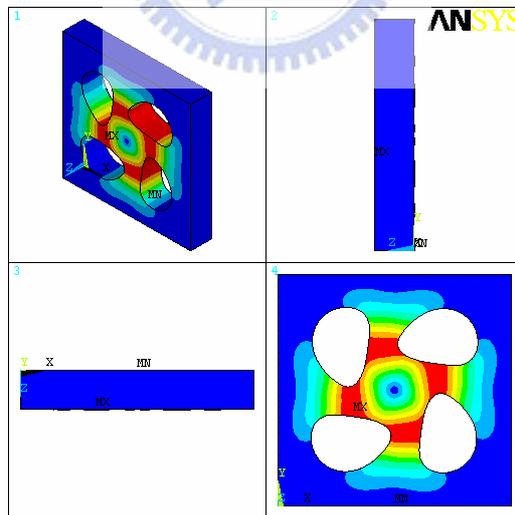


圖 4-2-10 固定支承，第六模態 $R/L=0.292$

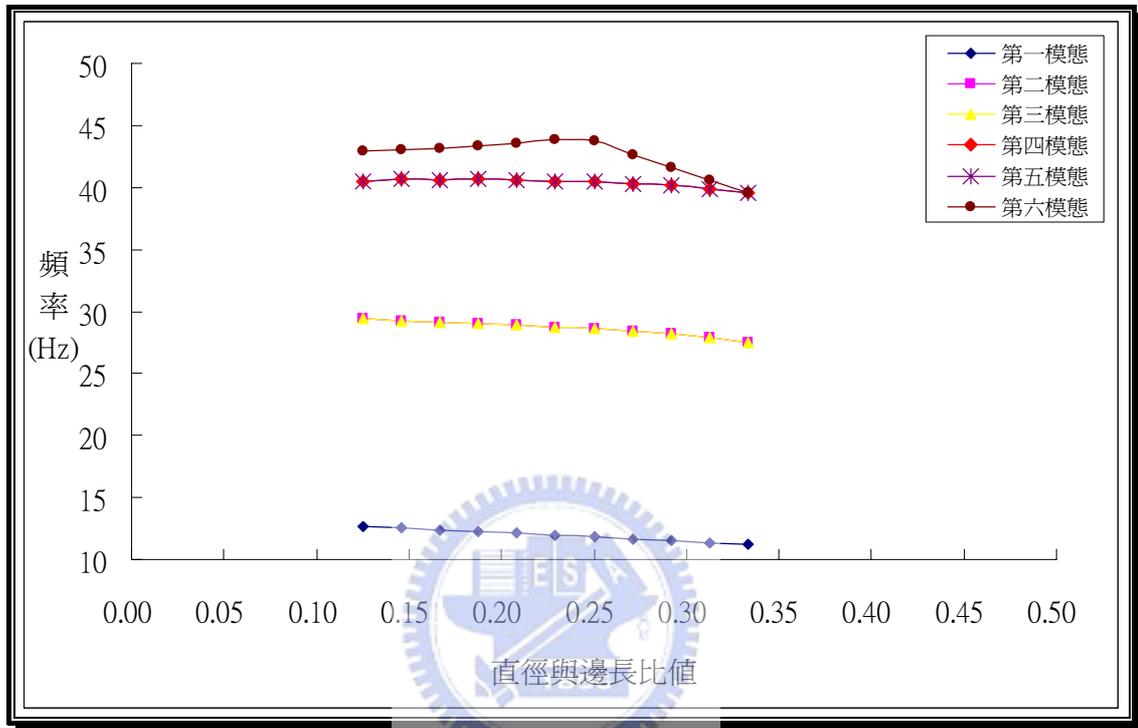


圖 4-2-11 簡支承，開孔半徑改變之模態頻率曲線圖

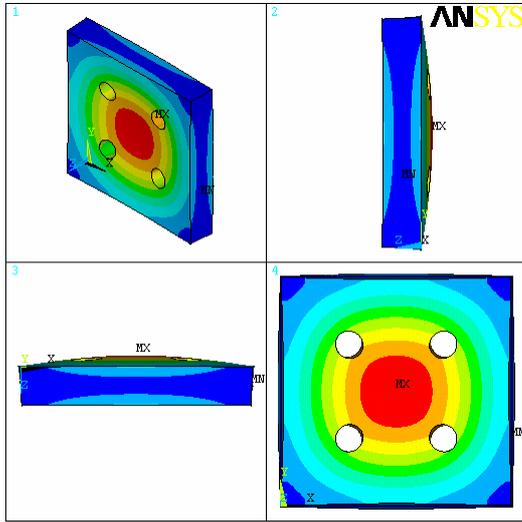


圖 4-2-12 簡支承，第一模態

$R/L=0.125$

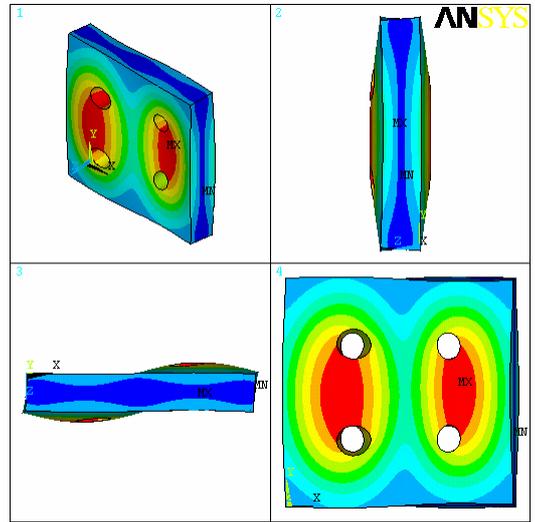


圖 4-2-13 簡支承，第二模態

$R/L=0.125$

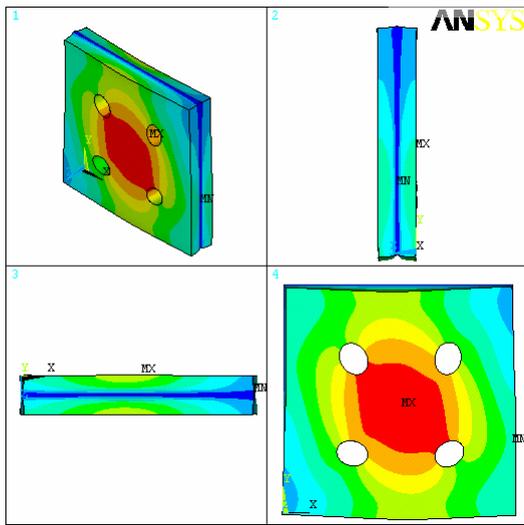


圖 4-2-14 簡支承，第四模態

$R/L=0.125$

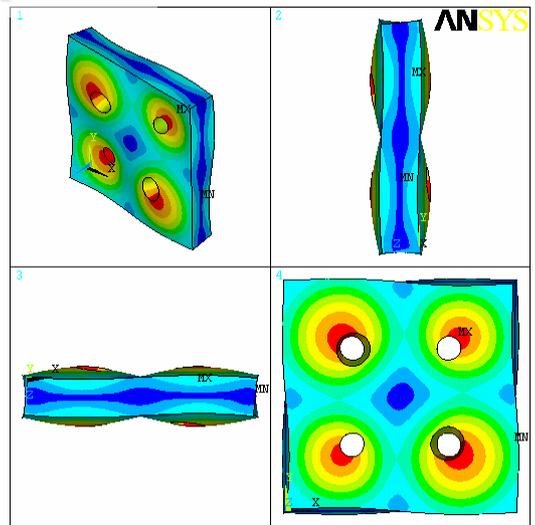


圖 4-2-15 簡支承，第六模態

$R/L=0.125$

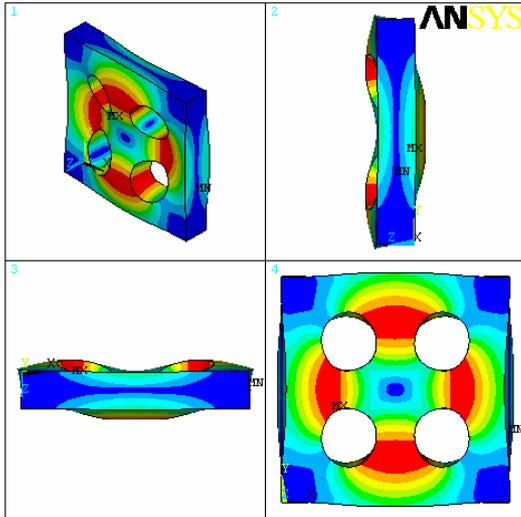


圖 4-2-16 簡支承，第六模態

$R/L=0.25$

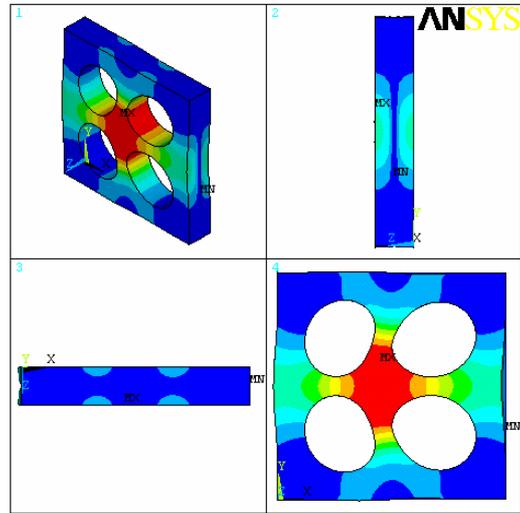


圖 4-2-17 簡支承，第六模態

$R/L=0.333$

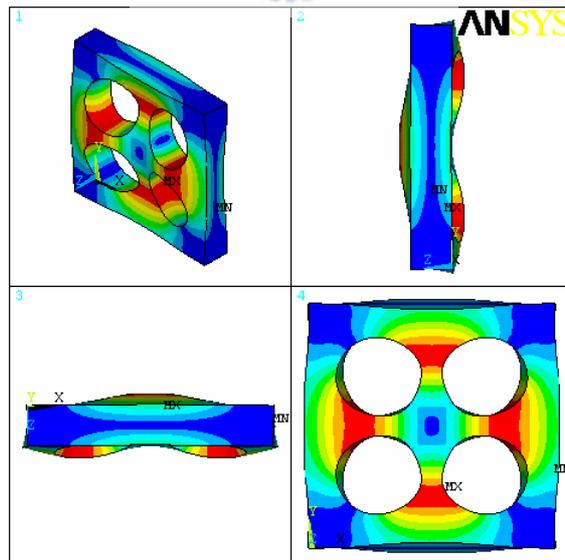


圖 4-2-18 簡支承，第四模態 $R/L=0.333$

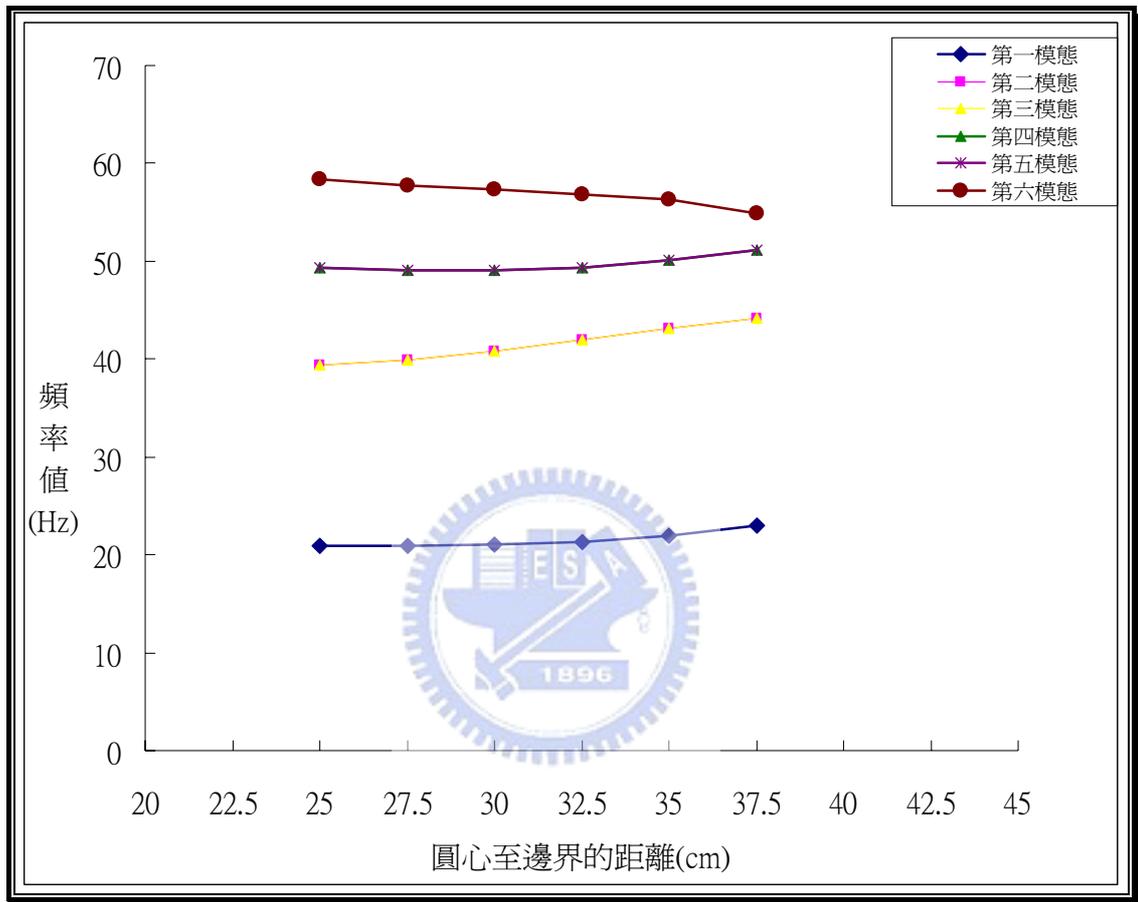
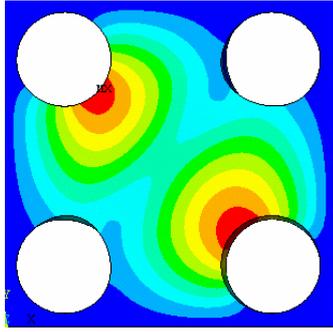
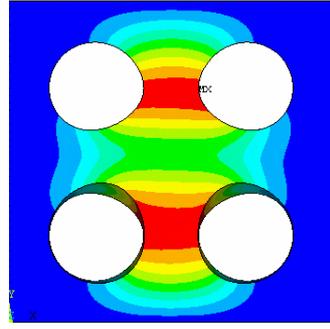


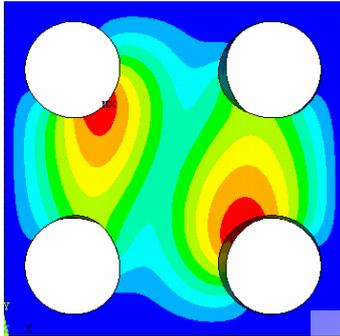
圖 4-3-1 固定支承，開孔圓心位置不同之前六個模態



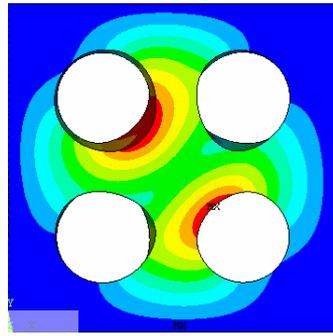
開孔圓心至邊界距離=22.5



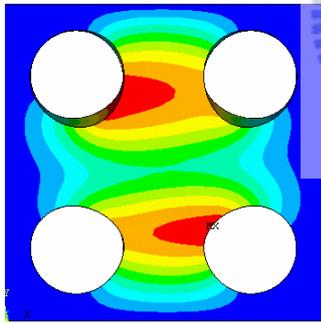
開孔圓心至邊界距離=32.5



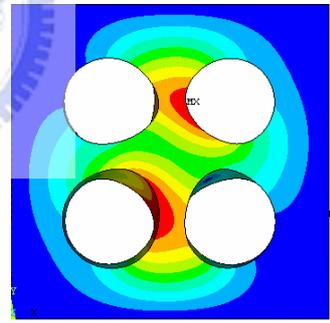
開孔圓心至邊界距離=25



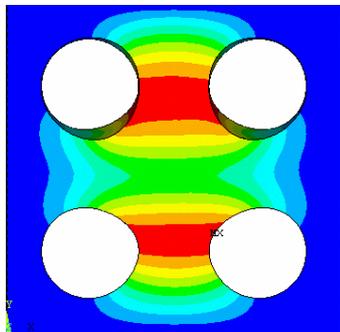
開孔圓心至邊界距離=35



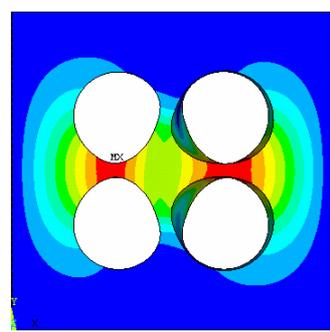
開孔圓心至邊界距離=27.5



開孔圓心至邊界距離=37.5



開孔圓心至邊界距離=30



開孔圓心至邊界距離=40

圖 4-3-2 開孔位置不同的第三模態之比較

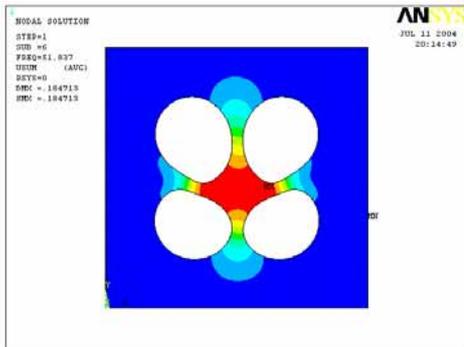
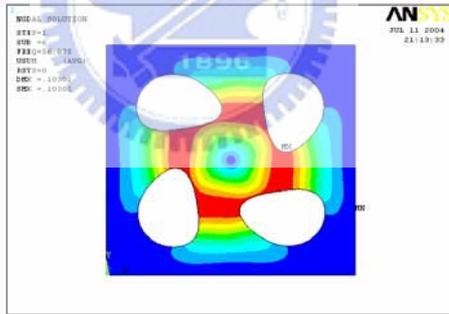
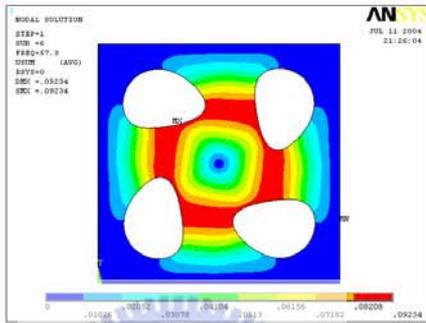
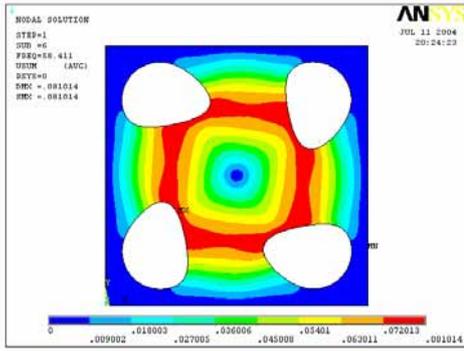


圖 4-3-2 開孔位置不同的第六模態之比較

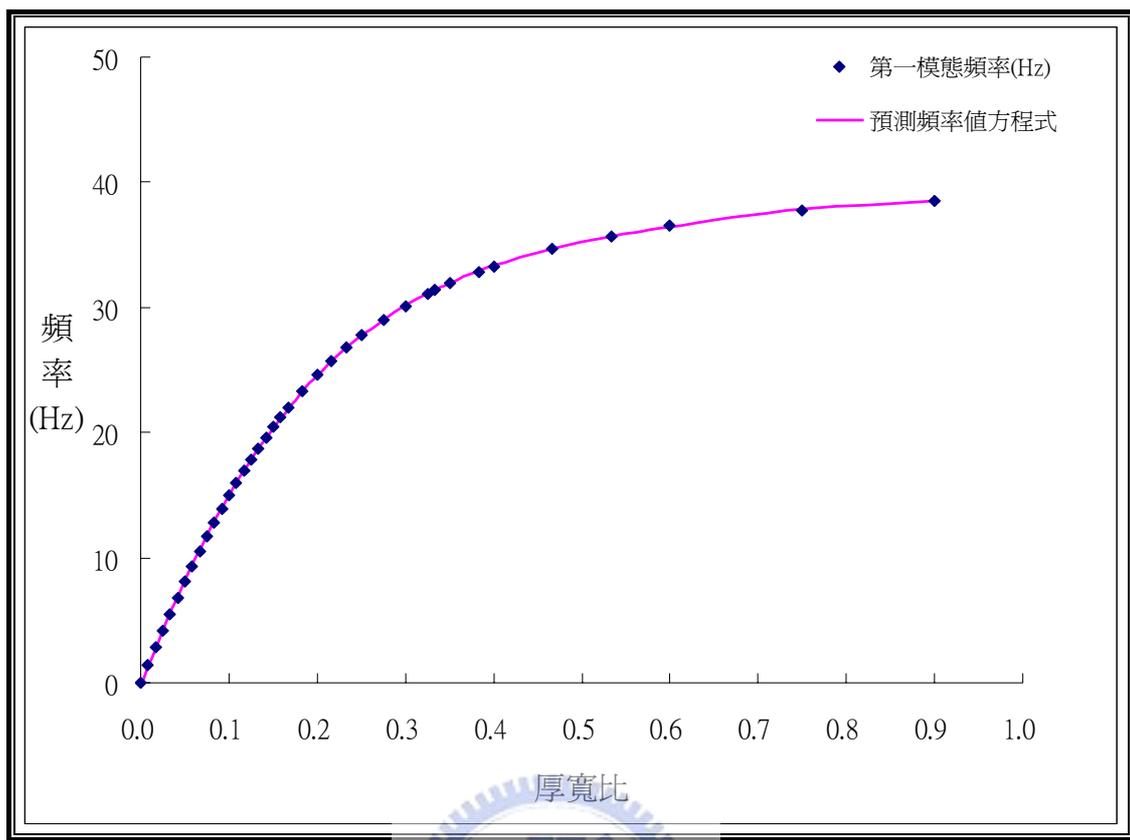


圖 4-4-1 固定支承，不同厚寬比之第一模態與預測方程式計算值之數值比較曲線

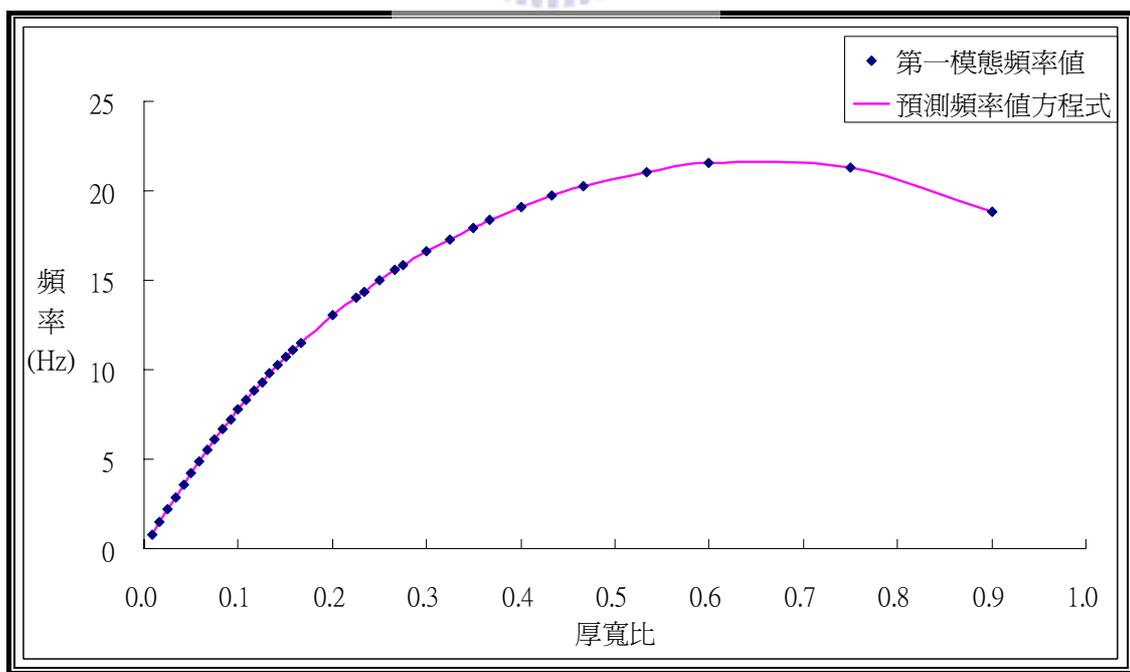


圖 4-4-2 簡支承，不同厚寬比之第一模態與預測方程式計算值的數值比較曲線

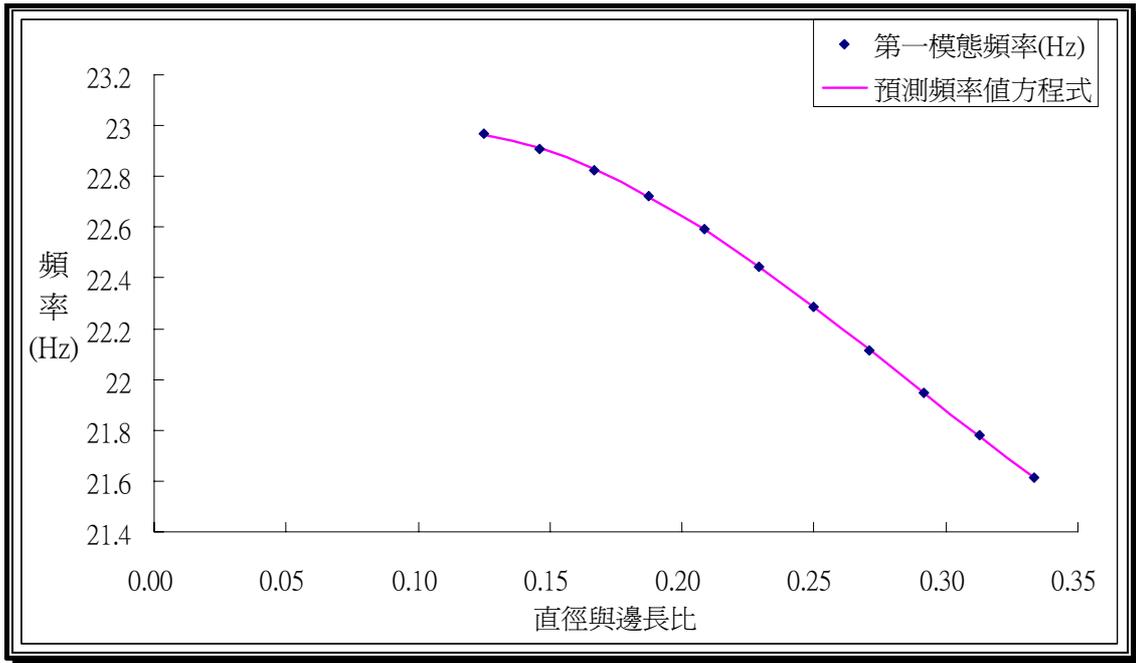


圖 4-4-3 固定支承，不同直徑與邊長比之第一模態與預測方程式計算值之數值比較曲線

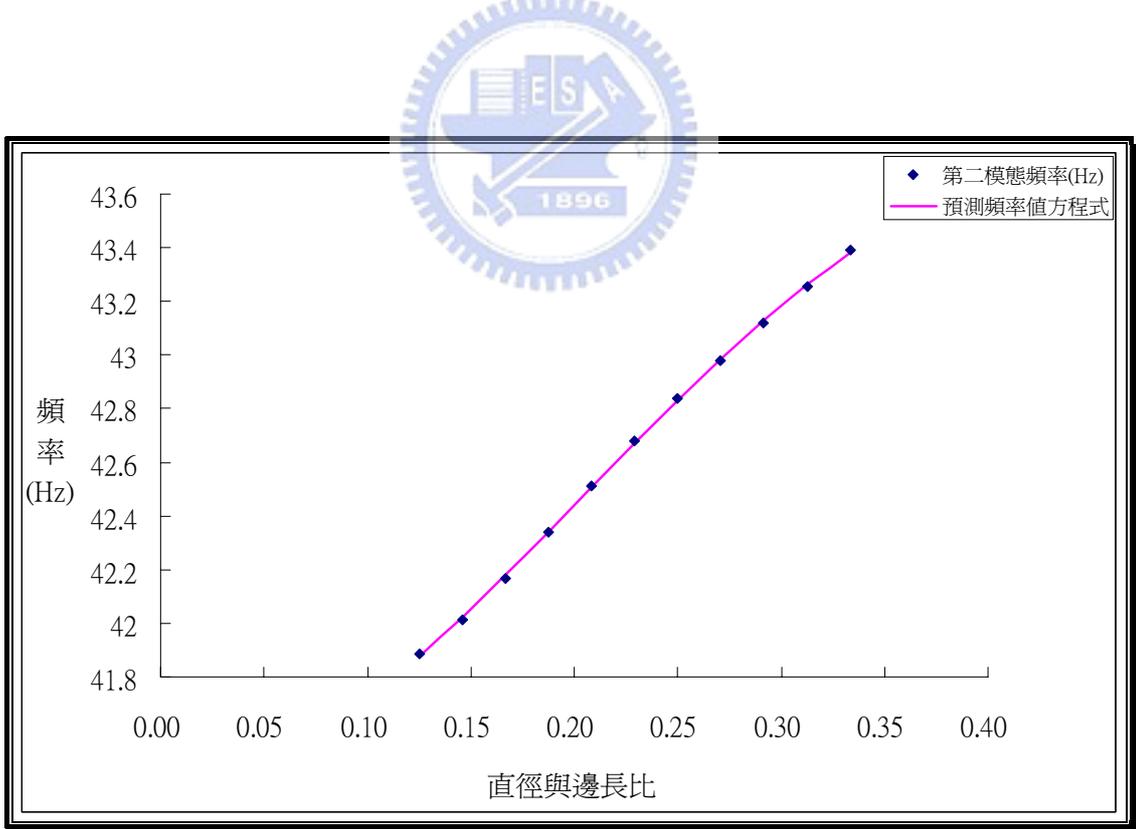


圖 4-4-4 固定支承，不同直徑與邊長比之第二模態與預測方程式計算值的數值比較曲線

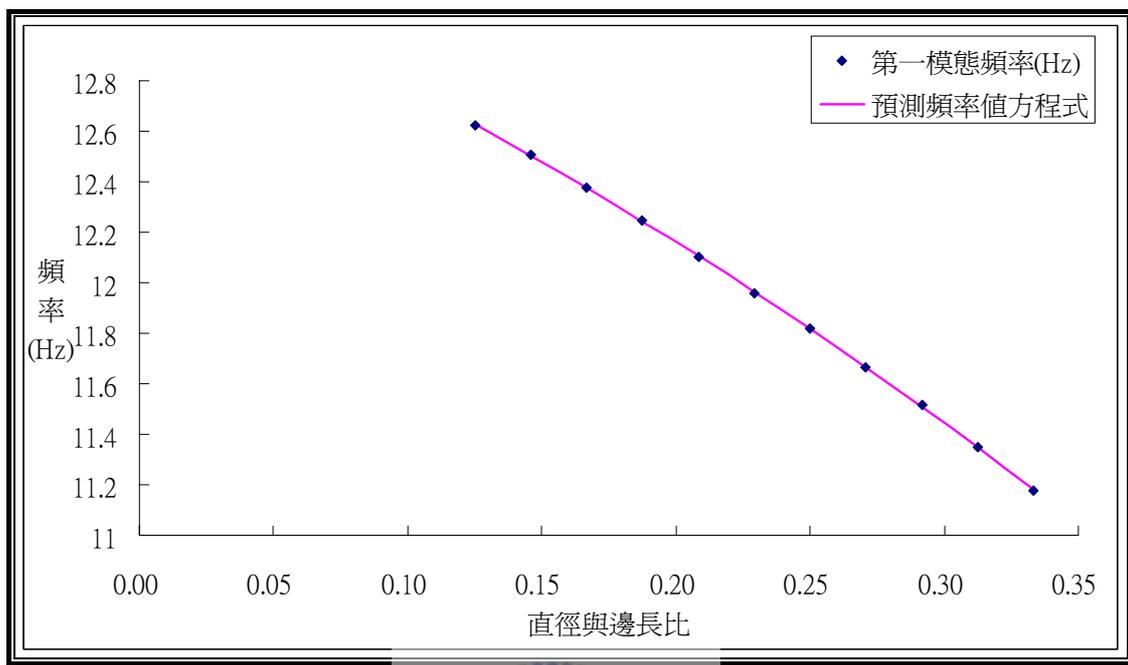


圖 4-4-5 簡支承，不同直徑與邊長比之第一模態與預測方程式計算值的數值比較曲線

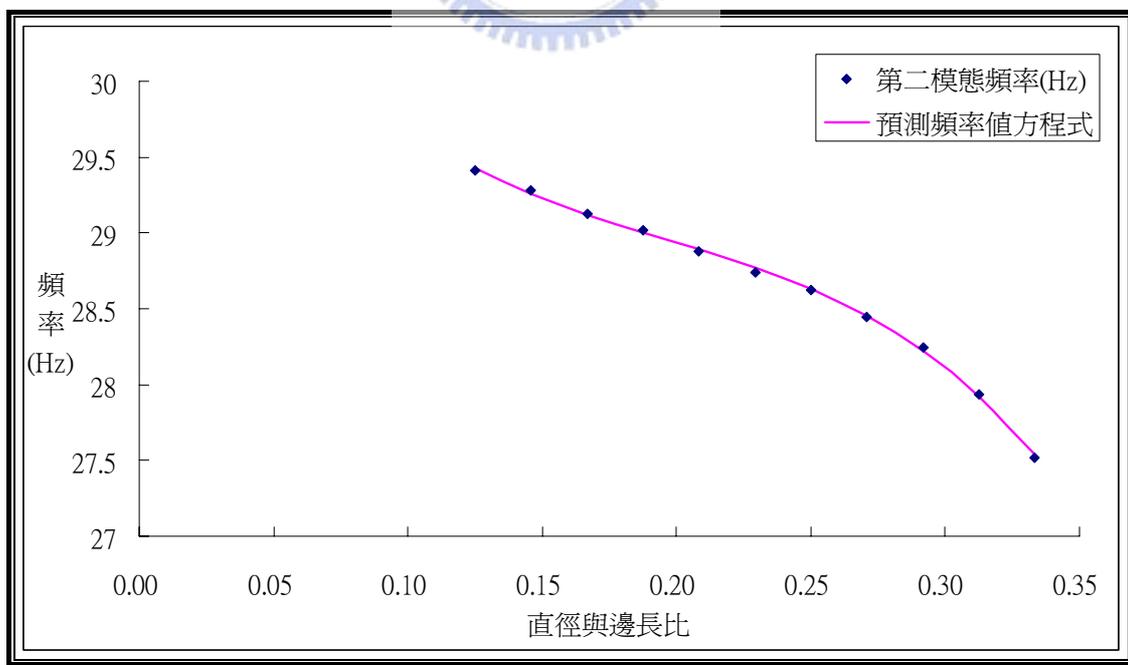


圖 4-4-6 簡支承，不同直徑與邊長比之第二模態與預測方程式計算值的數值比較曲線