

# MIDAS CFD 分析

## 太陽能板日照通風散熱分析

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風洞實驗室

# Wind engineering

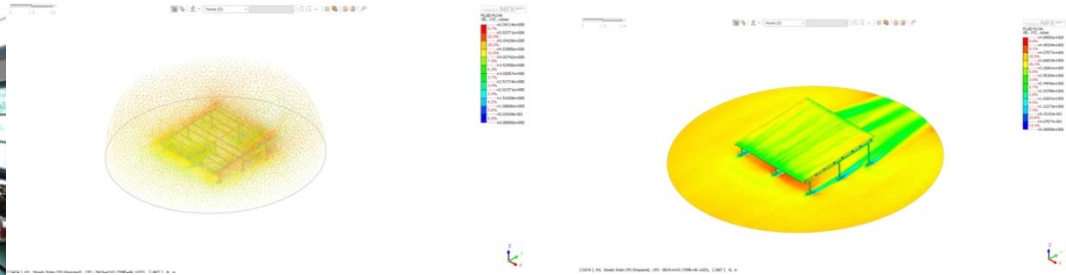
Wind engineering is a subset of mechanical engineering, structural engineering, meteorology, and applied physics that analyzes the effects of wind in the natural and the built environment and studies the possible damage, inconvenience or benefits which may result from wind.

The tools used include atmospheric models, wind tunnel experiment, and computational fluid dynamics models.

## Wind Tunnel Experiment



## Computational fluid dynamics

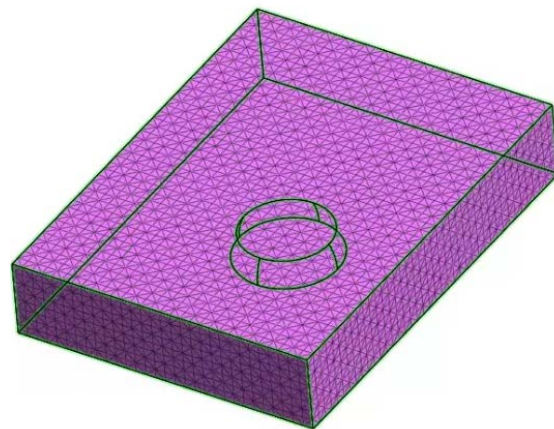
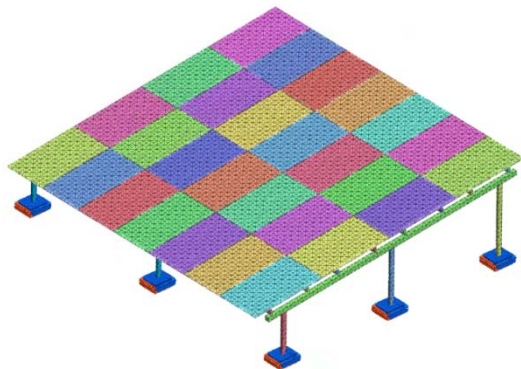
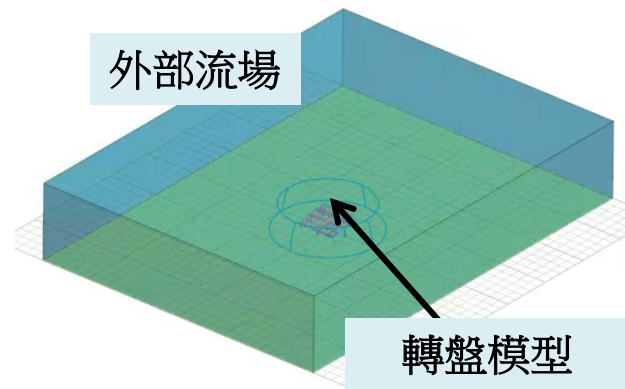
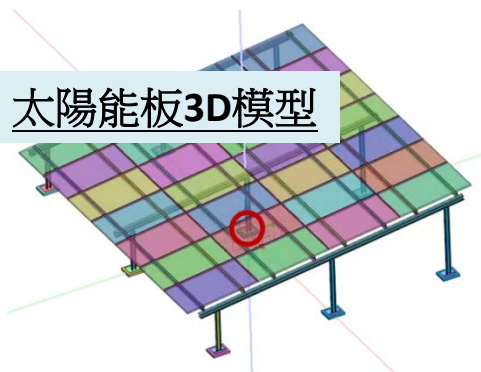


**Solar panels**

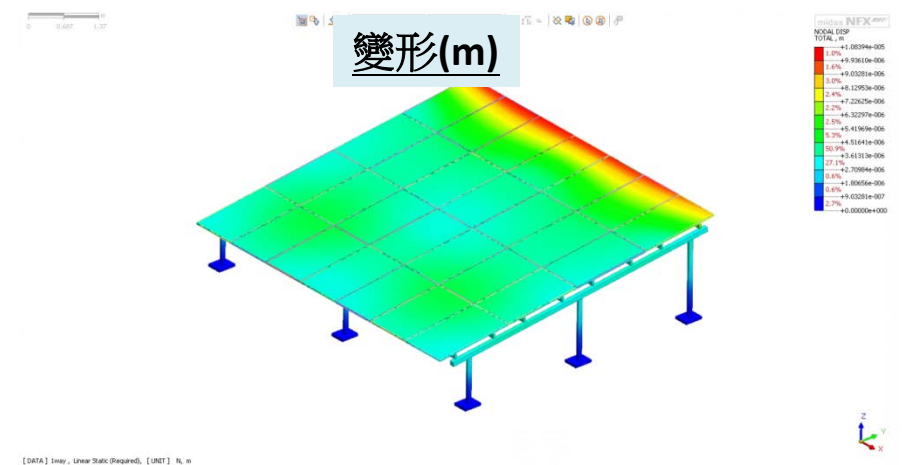
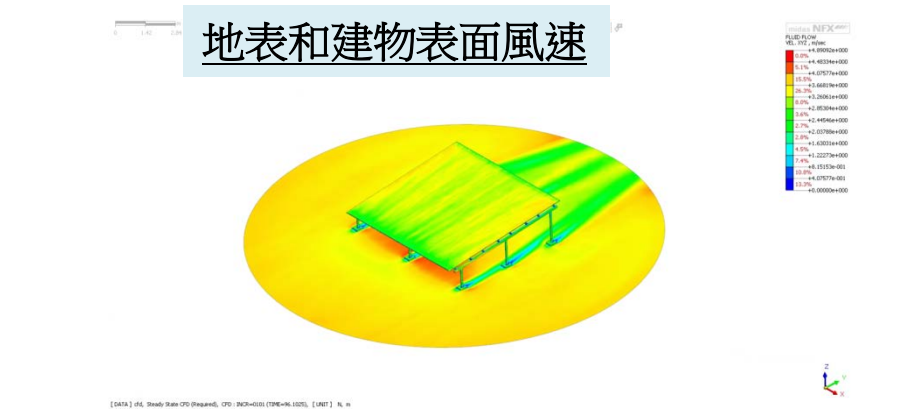
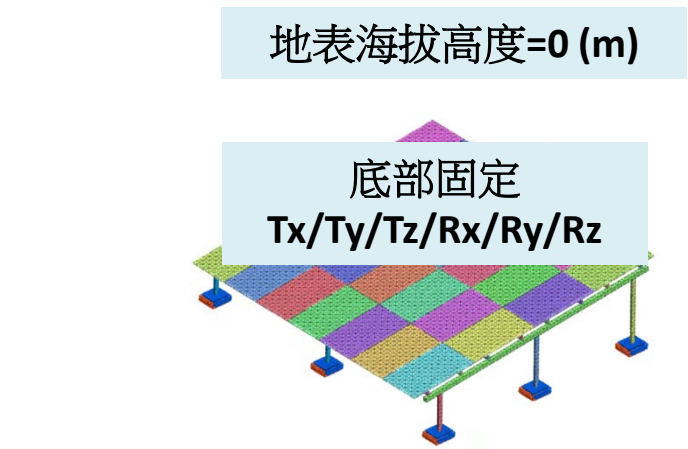
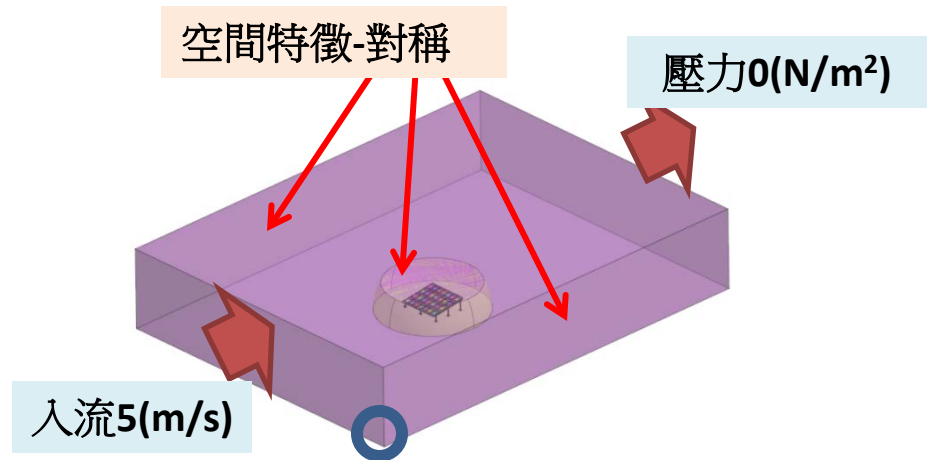
## Reference

[https://en.wikipedia.org/wiki/Wind\\_engineering](https://en.wikipedia.org/wiki/Wind_engineering)

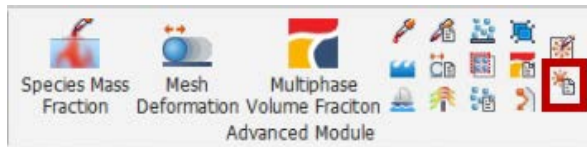
# 分析模型建立



# 太陽能板受強風下結構強度計算(流固耦合計算)



# 日照熱輻射&熱對流分析



**Solar Load Definition**

ID: 1 Name: Solar Load-1

**Solar Calculator**

**Global Position**  
Longitude: 127 deg  
Latitude: 37.56 deg  
Timezone: 9 GMT

**Date and Time**  
Month: 1 Hour: 0  
Day: 1 Minute: 0

**Options**  
☐ Theoretical Maximum  
☒ Fair Weather Conditions  
Sunshine Factor: 1

**Mesh Direction**  
North Vector: 0, 1, 0  
East Vector: 1, 0, 0

**Illumination Parameters**  
☒ Sun Direction Vector: 0, 0, 1  
☒ Direct Solar Irradiation: 1423 W/m<sup>2</sup>  
☒ Diffuse Solar Irradiation: 200 W/m<sup>2</sup>

Spectral Fraction:  $V/(V+IR)$ : 0.5  
Scattering Fraction: 1 Ground Reflectivity: 0.2

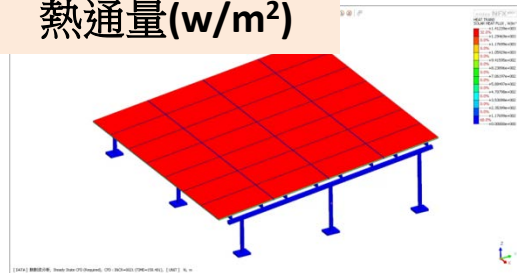
OK Cancel Apply

陽光照射方向:Z方向

太陽能(直射)輻射熱:1423 (W/m<sup>2</sup>)

太陽能(漫射)輻射熱:200 (W/m<sup>2</sup>)

日照產生  
熱通量(W/m<sup>2</sup>)



溫度(°C)

