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論文名稱: 在密閉容器中旋轉物體所造成流場與熱傳振盪暫態現象之研究

英文論文名稱: Transient Leading to Periodic Fluid Flow and Heat Transfer in a Cavity Due to a Ro

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學位類別: 碩士

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學號: 93458035

學年度: 94

語文別: 中文

論文頁數: 122

關鍵詞: 滑動網格 ; 計算流體力學 ; 泰勒不穩定度 ; 紐賽數

英文關鍵詞: sliding mesh ; Taylor instabilities ;
Computational Fluid Dynamics (CFD) ;
Nusselt number

[摘要]

在許多工程結構中常常可看見與容器有關的結構物，包括了混合腔體、電子產品冷卻、建築通風、太陽能集熱器及
爲工業界及學者所探討。本文利用計算流體力學軟體FLUENT針對密閉方形容器正中央放入不同形狀（包括圓形、
體旋轉對容器內流場及溫度場的影響。本文假設容器內流體的普朗特常數等於5，並假設流體流動屬於層流狀態，
另一爲絕熱旋轉體；在不同的邊界條件下，物體於時間t = 0時開始旋轉同時固定角速度，並忽略自然對流。根據模
形成的渦流之間交互作用的情形以及對於不同形狀物體所形成流場與溫度場的相似性有詳細的探討。在兩種邊界係
造成的旋轉體表面及容器壁之暫態平均紐賽數出現週期振盪的現象愈明顯，然而圓形案例中則未發現週期振盪的情
平均計算後得知，在高雷諾數的案例中，容器壁的熱傳性能與旋轉體的形狀無關，然而在較低雷諾數情況下，三角
體的所有案例中也呈現出相同的現象。

[英文摘要]

In many engineering applications, there are a lot of equipments composed of the cavity, including mixing chambe
collection of solar energy and heat storage system, etc. The complex flow field and heat transfer characteristics w
researchers. In this study, the CFD software FLUENT is adopted to simulate the flow and temperature fields of va
triangle) with different sizes placed in the middle of a square cavity. The Prandtl number of the fluid within the ca
laminar. Two kinds of thermal boundary conditions are considered in this study. One is the isothermal rotating ob
motionless object is set in rotation at time t=0 with a constant angular velocity. The effect of natural convection is
evolving flow field and the interaction of the rotating objects with the recirculating vortices at the four corners are
fields for various shapes is discussed. In the cases of both boundary conditions, the periodic oscillation of transie
surface of the rotating object and cavity walls becomes obvious as the Reynolds number decreases. However, p
circle object. For the cases of isothermal rotating objects, time-integrated average Nusselt number of the cavity is
However, at lower Re, the triangle object clearly exhibits superior heat exchange capability followed by the squar
of isothermal objects also appear in the cases of adiabatic objects.

[論文目次]

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