



شبكة المعلومات الجامعية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ





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# شبكة المعلومات الجامعية

## التوثيق الالكتروني والميكرو فيلم

# جامعة عين شمس

التوثيق الالكتروني والميكرو فيلم

## قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها  
علي هذه الأفلام قد اعدت دون أية تغيرات



## يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of  
15 – 25c and relative humidity 20-40 %



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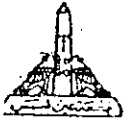
# بعض الوثائق الأصلية تالفة



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بالرسالة صفحات  
لم ترد بالأصل



# *Flow of a fluid near a plate and its stability*

Thesis

Submitted in partial fulfillment for requirement of the Master Degree  
in Science (Applied Mathematics)

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## List of Symbols

### English Symbols

$a_1, a_2$	dimensionless of the wave numbers in x- and y- directions
$a_{ij}$	elements of the matrix
$B$	magnetic induction
$C$	concentration of the fluid
$C_f$	local skin friction, $\frac{2\tau_o}{\rho U^2}$
$C_p$	specific heat at constant pressure
$D$	mass diffusivity
$d$	maximum value of boundary layer thickness
$E$	electric field
$E_c$	Eckert number, $\frac{U^2}{C_p(T_o - T_\infty)}$
$f$	dimensionless stream function of velocity
$g$	acceleration due to the gravity
$Gr(x)$	Grashof number, $\frac{g\beta_T(T - T_\infty)x^3}{4\nu^2}$
$H$	magnetic field
$H_1, H_2$	Induced magnetic field components in x- and y- directions
$J$	current density
$K$	thermal diffusivity, $\frac{k}{\rho C_p}$
$k$	thermal conductivity
$k_x, k_y$	wave numbers in x- and y -directions
$M$	magnetic Prandtl number, $\frac{\nu}{\alpha_1}$
$m''$	rate of diffusion in y direction per unit area
$N$	buoyancy ratio, $\frac{\beta_c(C_o - C_\infty)}{\beta_T(T_o - T_\infty)}$
$Nu$	Nusselt number
$P$	pressure of the fluid

Pr	Prandtl number, $\frac{v_{\infty}}{K_{\infty}}$
Q	involves the magnetic field, $\frac{\mu_m^2 H^2 \sigma d^2}{v \rho}$
Re	local Reynolds number, $\frac{Ux}{v}$
Rm	local magnetic Reynolds number, $\frac{Ux}{\alpha_1}$
S, uns	refer to the stable region and unstable
Sc	Schmidt number, $\frac{v_{\infty}}{D_{\infty}}$
Sh	Sherwood number
T	temperature of the fluid
t	time
U	free stream velocity
u, v	velocity components in x- and y- directions
x, y	coordinate system

### Greek Letters

$\alpha, \beta_1, \beta_2$	parameters depending on the nature of the fluid
$\alpha_1$	magnetic diffusivity
$\alpha_2$	reciprocal of the magnetic Prandtl number, $\frac{\alpha_1}{v}$
$\beta$	magnetic number, $\frac{\mu_m H^2}{\rho U^2}$
$\beta_C, \beta_T$	coefficients of the thermal and mass expansion
$\delta$	boundary layer thickness
$\gamma$	dimensionless concentration
$\eta$	dimensionless distance from the plate
$\lambda$	buoyancy parameter, $\frac{Gr(x)}{[Re(x)]^2}$
$\mu$	coefficient of viscosity