Dynamics of Flapping Flag in Axial Flow[1] HAMID AIT ABDER-
RAHMANE, McGill University, MOHAMED FAYED, AMY-LEE GUNTER, Con-
cordia University, MICHAEL P. PAIDOUSSIS, McGill University, HOI DICK NG,
Concordia University — We investigate experimentally the phenomenon of the flap-
ping of a flag, placed within a low turbulent axial flow inside a small scale wind
tunnel test section. Flags of different sizes and flexural rigidities were used. Image
processing technique was used and the time series of a given point on the edge of the
flag was analyzed. The stability condition of the flag was obtained and compared to
the recent theoretical models and numerical simulations. Afterwards, the nonlinear
dynamics of the flapping was investigated using nonlinear time series method. The
nonlinear dynamics is depicted in phase space and the correlation dimension of the
attractors is determined. On the basis of observations made in this study, some
conclusions on the existing models were drawn.

Hoi Dick Ng
Concordia University

Date submitted: 28 Jul 2010   Electronic form version 1.4