Nastran+Femap see nx nastran quick reference guide

Femap -> txt -> nastran

basic geometry

geometry: point, line->points to connect points

modify->edit per cambiare coordinate

delete per eliminare punti

model->coordinate system per sistema di coordinate, anche relativo

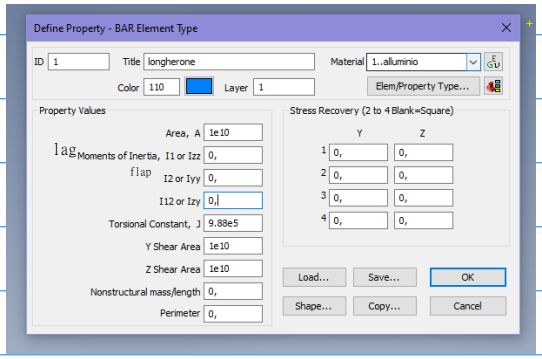
model->material per determinare materiale

model->property

property type per tipo di elemento

mass 0 per lumped masses

shape per disegnare sezione e proprietà



mesh->mesh control->size along curve: scegliere asse elastico e numero di elementi

mesh->geometry->select curve to mesh: scegliere curva e proprietà, poi scegliere vettore di orientazione per matrice di rigidezza

model->node per creare singoli nodi

model->element->rigid type per creare elementi rigidi con nodo indipendente e nodi dipendenti

lumped mass model

model->property->mass

organizzare opportunamenente le masse

model->constraint per mettere i vincoli

tools->mass properties per verificare correttezza massa

analyses->modal analysis->new+edit fino a modal analysis, poi fino a boundary conditions, poi scegliere print and postprocess

import per importare i risultati dell'analisi

postprocessing per vedere i risultati

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R E A L E I G E N V A L U E S

MODE NO.	EXTRACTION ORDER	EIGENVALUE	RADIANS	CYCLES	GENERALIZED MASS	GENERALIZED STIFFNESS
1	1	2.319998E+03	4.816636E+01	7.665914E+00	1.000000E+00	2.319998E+03
2	2	9.145025E+03	9.562963E+01	1.521993E+01	1.000000E+00	9.145025E+03
3	3	2.437773E+04	1.561337E+02	2.484945E+01	1.000000E+00	2.437773E+04
4	4	5.856992E+04	2.420122E+02	3.851744E+01	1.000000E+00	5.856992E+04
5	5	1.184307E+05	3.441377E+02	5.477121E+01	1.000000E+00	1.184307E+05
6	6	1.879873E+05	4.335751E+02	6.900562E+01	1.000000E+00	1.879873E+05
7	7	3.269323E+05	5.717799E+02	9.100160E+01	1.000000E+00	3.269323E+05
8	8	5.135756E+05	7.166419E+02	1.140571E+02	1.000000E+00	5.135756E+05
9	9	7.021535E+05	8.379460E+02	1.333632E+02	1.000000E+00	7.021535E+05
10	10	8.705499E+05	9.330326E+02	1.484968E+02	1.000000E+00	8.705499E+05

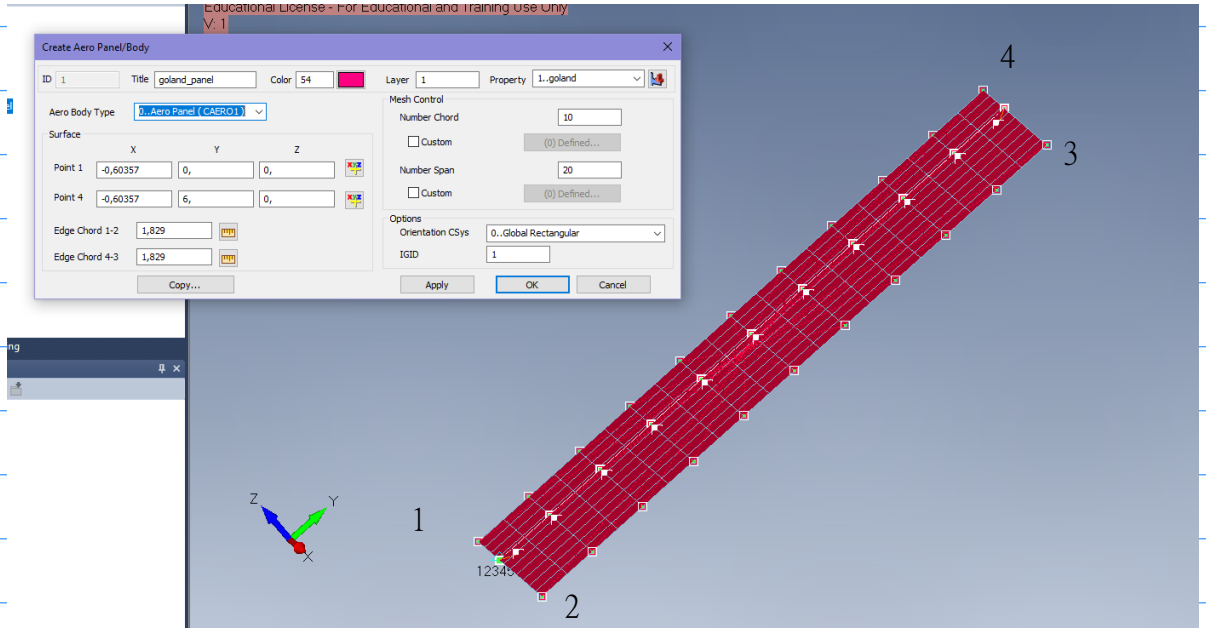
Rad/s Hz

analisi flutter/aerodinamica

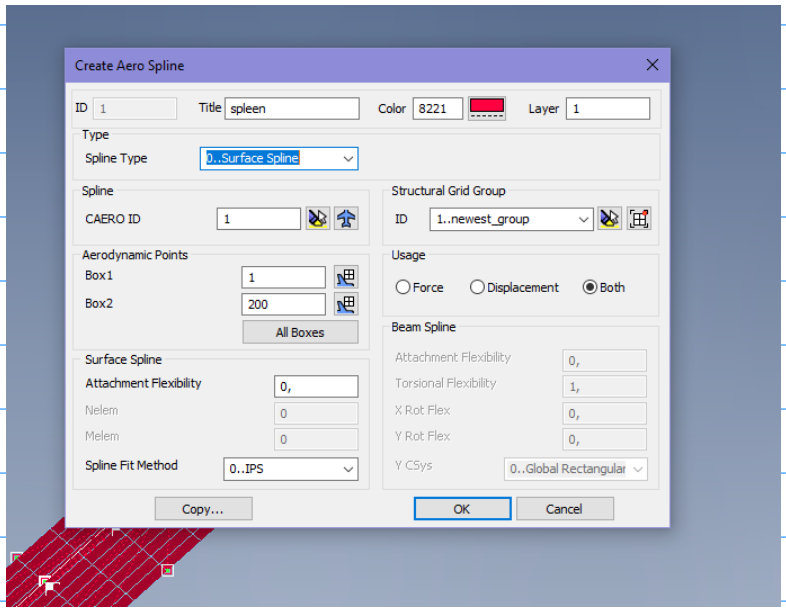
definire proprietà:model->aeroelasticity->property

scegliere pannelli o volumi a seconda del corpo

creare mesh: model->aeroelasticity->panel/body

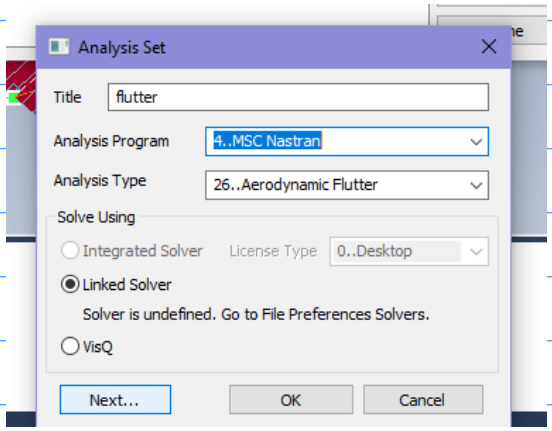


create spline: model->aeroelasticity->spline



Flutter analysis

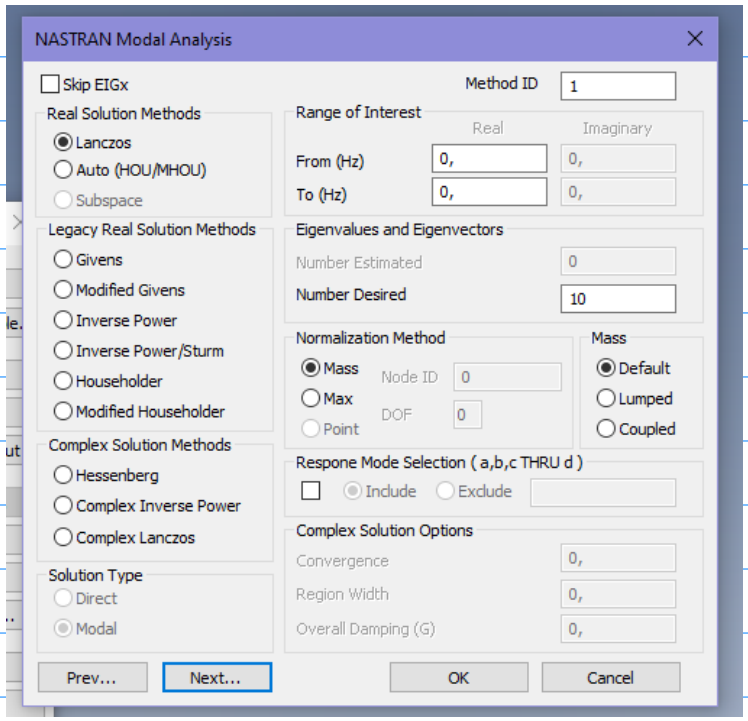
model->analysis



second screen is ok

third is ok + PRGPST

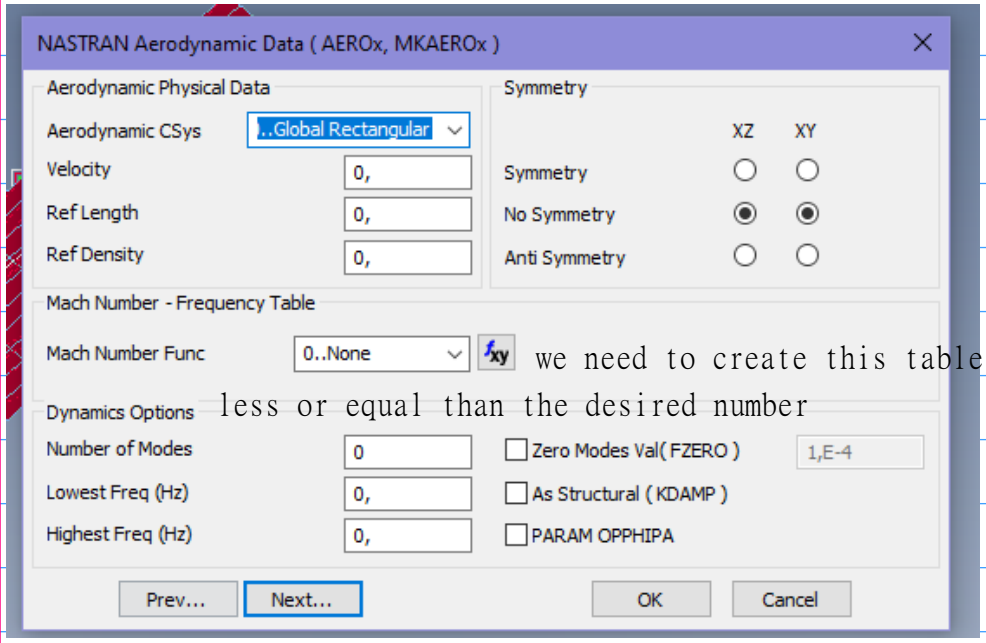
all ok until modal analysis



use lanczos for real eigs

use complex lanczos for complex eigs

choose number of modes



choose velocity

in this case it's the total span

1.225 kg/m^3

we need to create this table

less or equal than the desired number

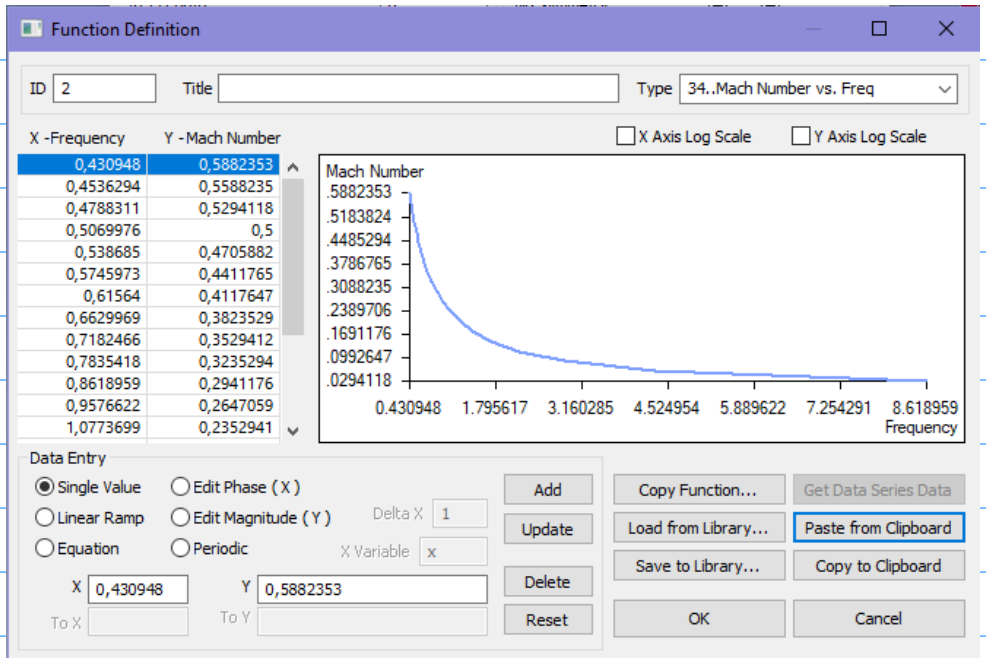
if we impose a simmetry (ex wing) we use the entire span

mach/frequency table

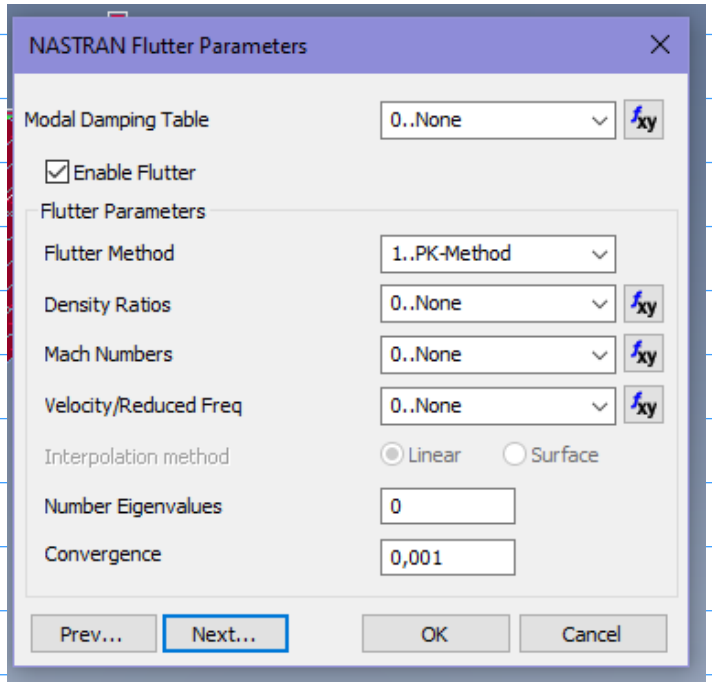
construct a table in excel for the desired mode, for example the torsional one

F=15 Hz k=F*2*pi*chord/2*(1/U_inf)

chord=1.829



last important sheet



for change in altitude

change in mach

put velocity and k

mettere numero di autovalori

select BC

print and postprocess output

recuperare i risultati da f06, flutter summary

tabulare e processare