



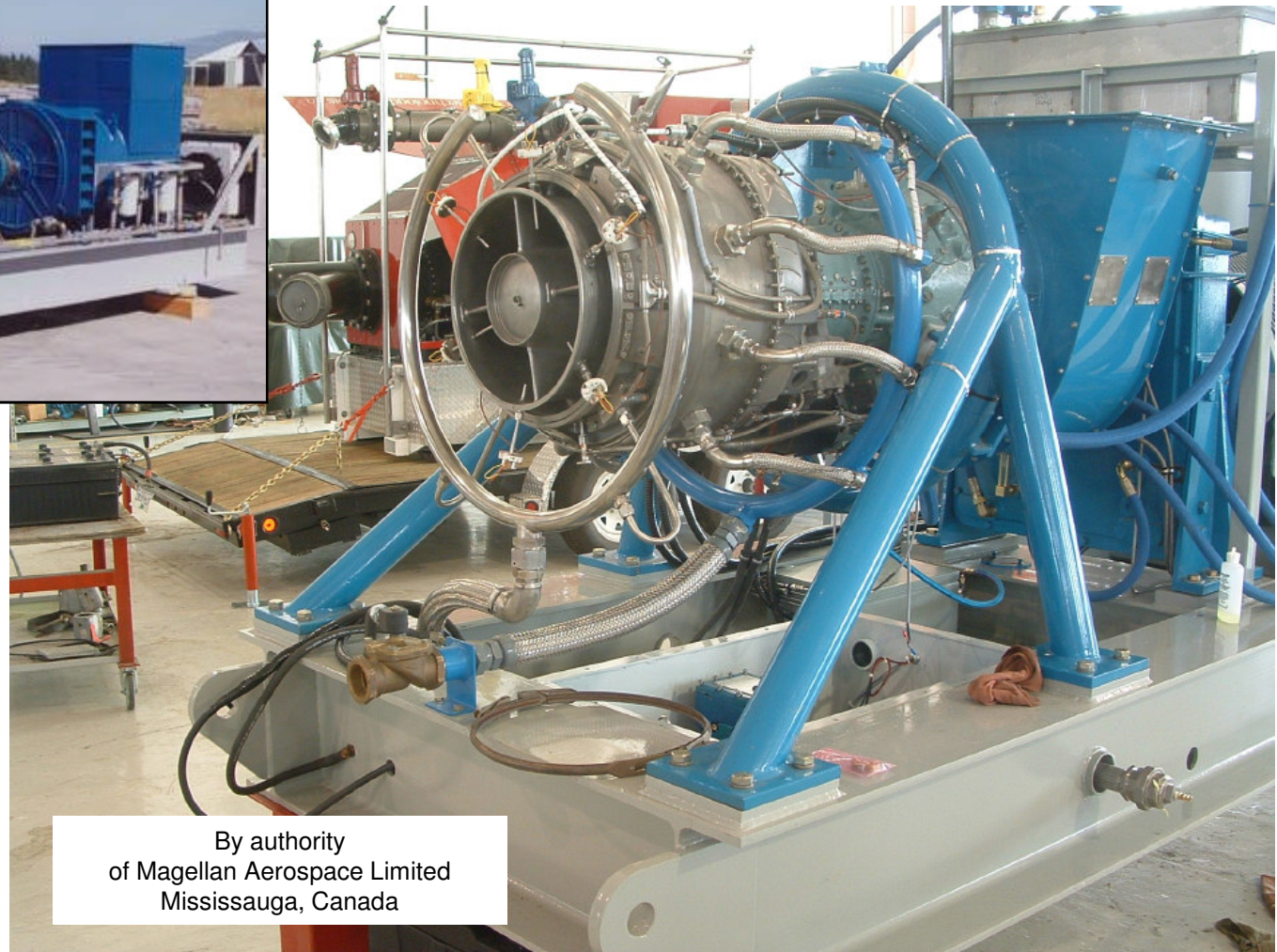
Modeling and analysis T53 engine

DYNAMICS R4

Alfa-Tranzit Co., Ltd



LYCOMING T-53 Gas-Turbine Engine for industrial application

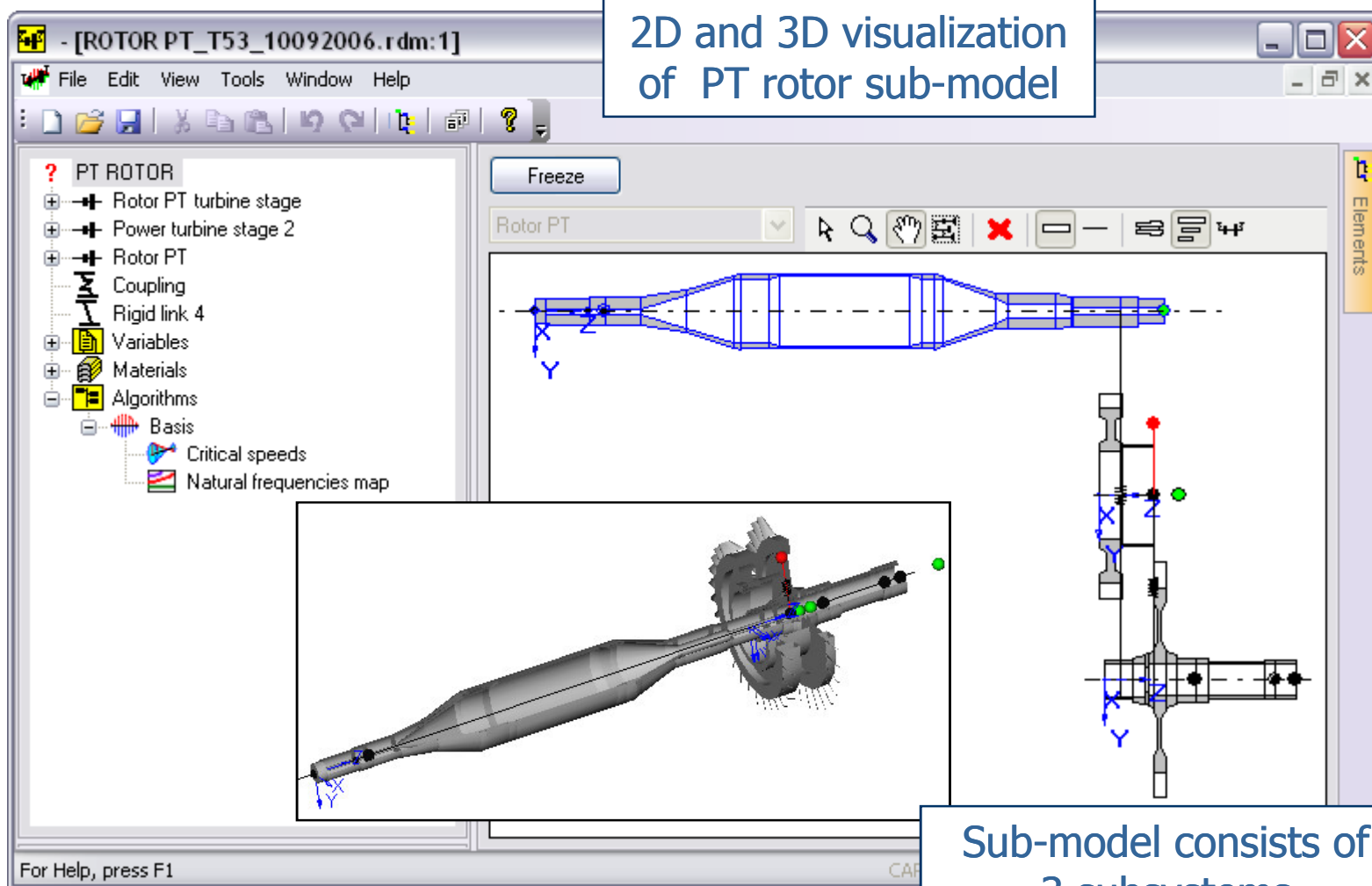


By authority
of Magellan Aerospace Limited
Mississauga, Canada

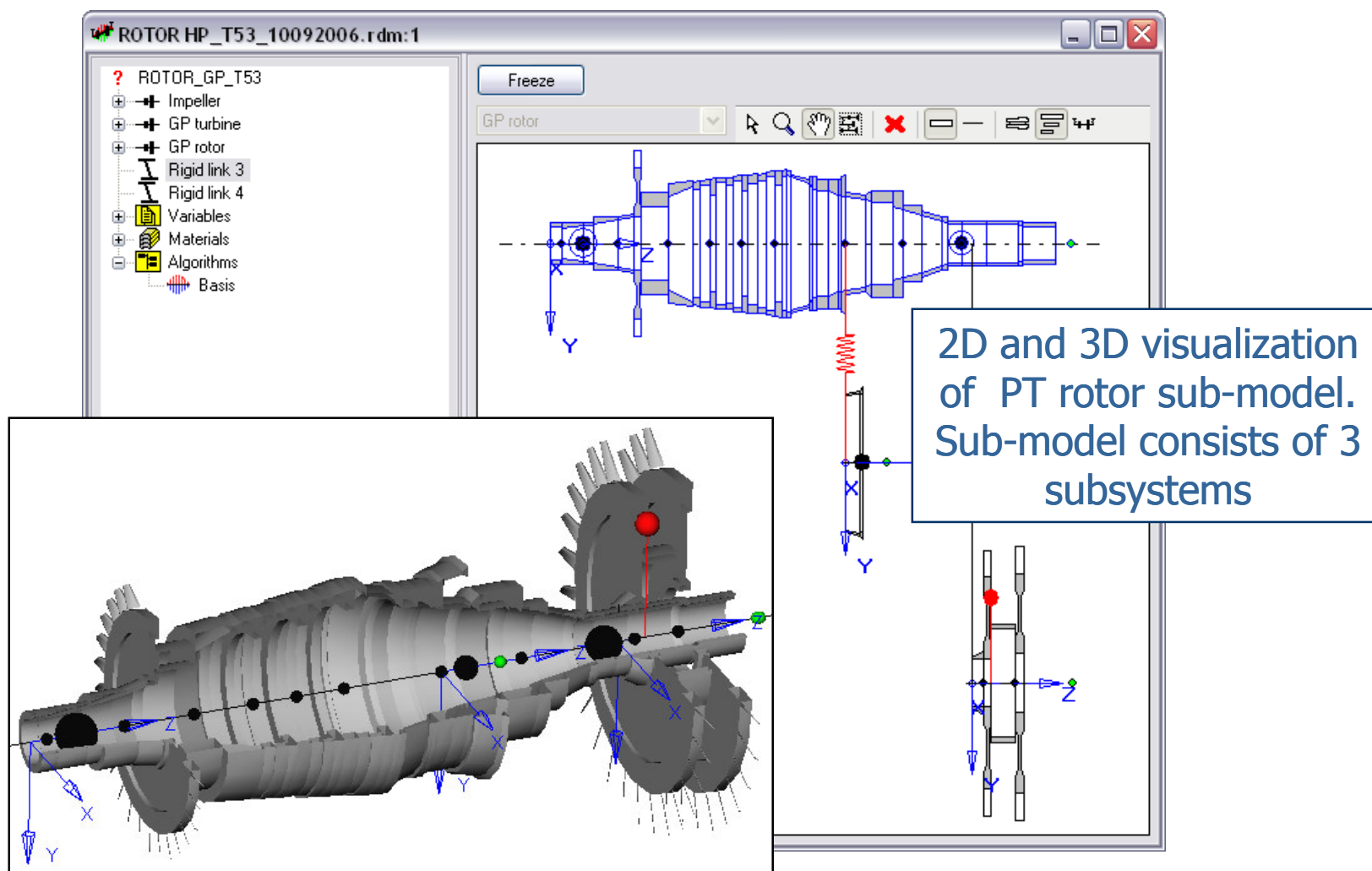
DYNAMICS R4

Alfa-Tranzit Co., Ltd
(495)232-60-91
www.alfatran.com

PT rotor sub-model



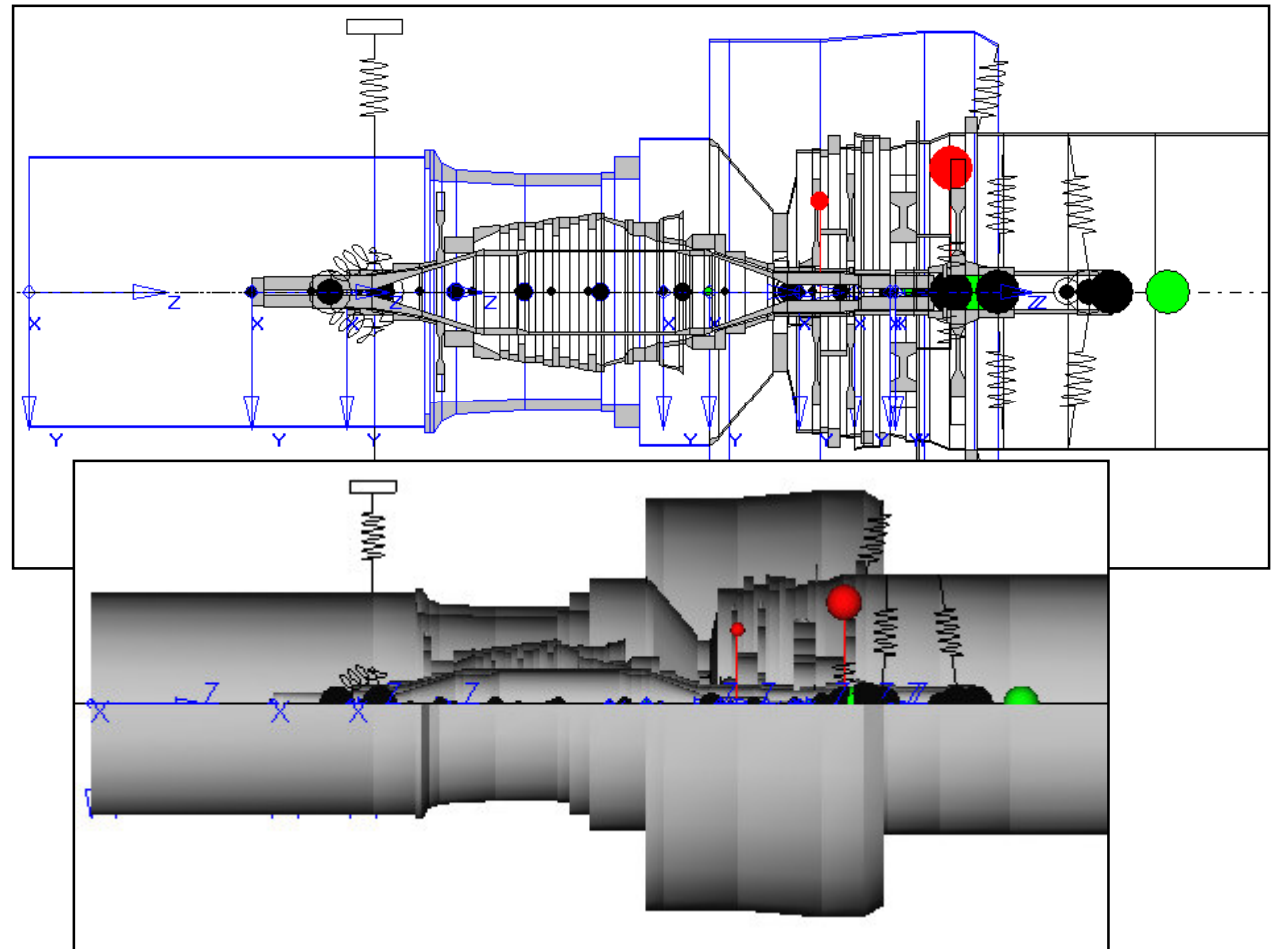
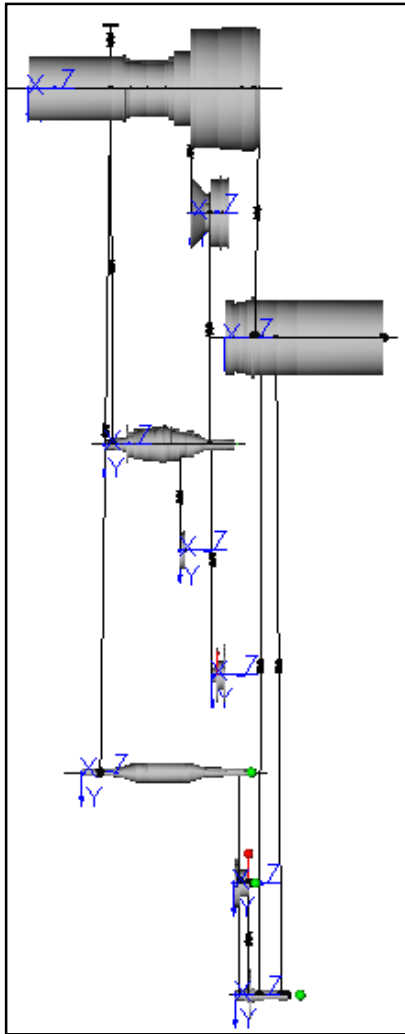
GP rotor sub-model



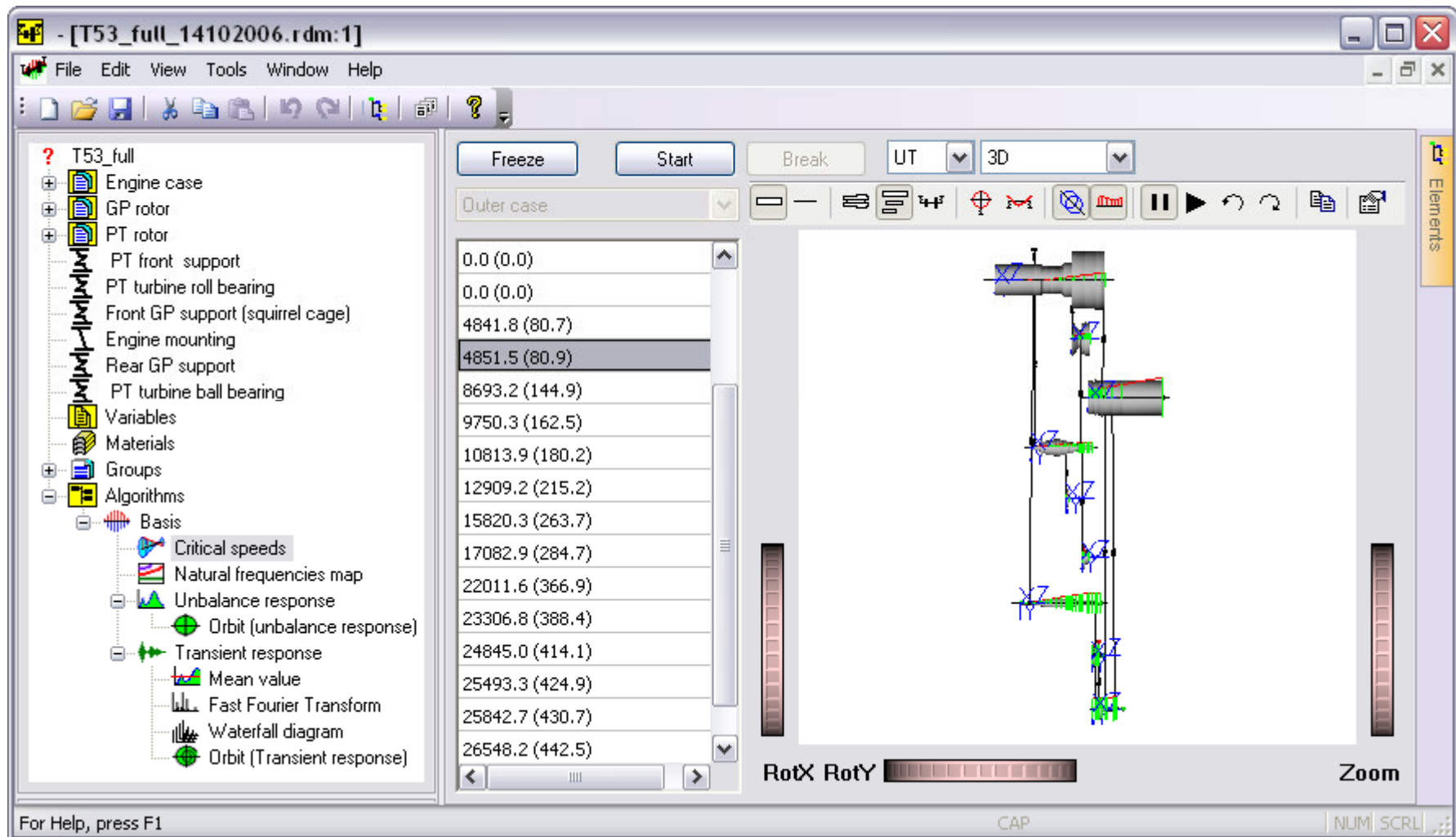
Full engine multi-level model



Feature of T53 gas-turbine engine - birotating turbine



Critical speeds and mode shapes of the power plant model



Energy distribution on subsystems and bearings

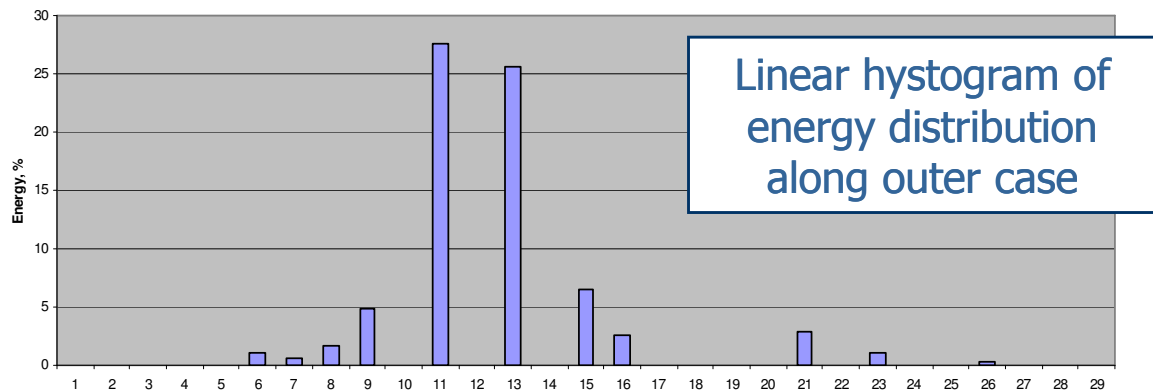
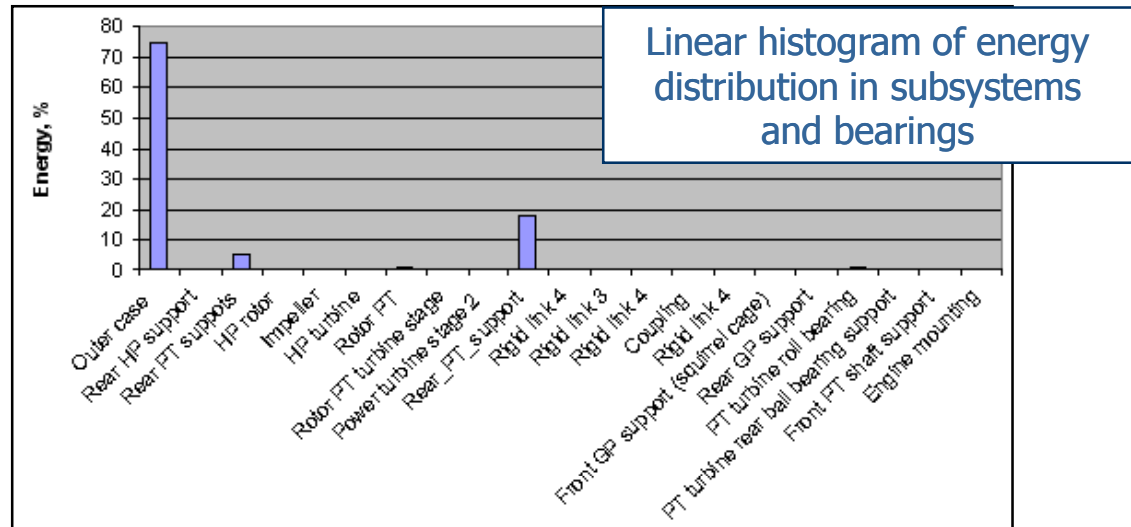
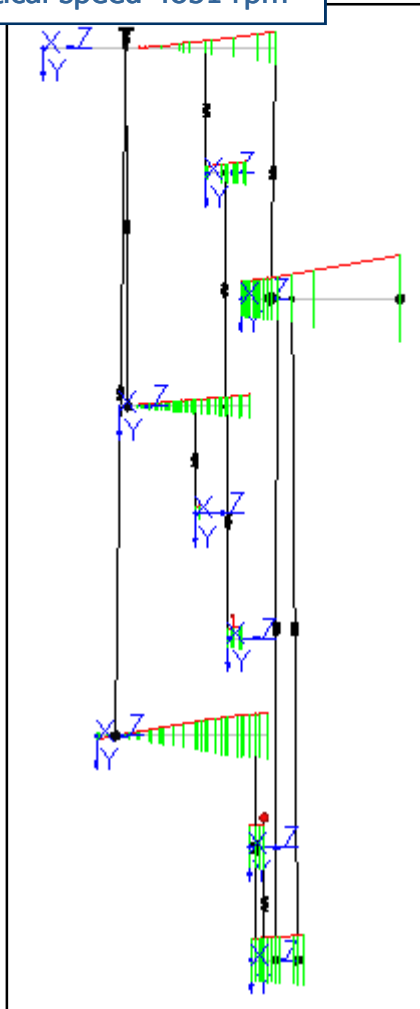


Assembly	4851	10814	13380	17083	25073
Outer case	74.626	0.395	3.732	32.413	5.035
Rear GP support case	0.072	0.184	0.261	7.001	71.965
Rear PT suppots case	5.432	0.229	10.926	21.92	6.812
GP rotor	0.021	3.133	0.237	2.692	0.556
Impeller	0	0.044	0.002	0.048	0.011
GP turbine	0.003	0.006	0.038	0.488	0.097
Rotor PT	0.358	0.042	39.138	0	2.023
Rotor PT turbine stage	0.009	0.001	0.472	0.002	0.03
Power turbine stage 2	0.213	0.011	10.35	0.099	1.475
Rear PT support	18.34	0.35	5.762	24.919	7.741
Rigid link 4	0	0	0	0	0
Rigid link 3	0	0	0	0	0
Rigid link 4	0	0	0	0	0
Coupling	0	0	0.004	0	0
Rigid link 4	0	0	0	0	0
Front GP support (squirrel cage)	0.034	94.279	0.037	1.722	0.046
Rear GP support	0.073	1.307	0.493	8.392	1.712
PT turbine roll bearing	0.732	0.014	23.141	0.26	1.1
PT turbine ball bearing	0.085	0.006	5.178	0.043	1.366
PT front support	0.002	0	0.228	0	0.03
Engine mounting	0	0	0	0	0

Energy distribution charts



Critical speed 4851 rpm

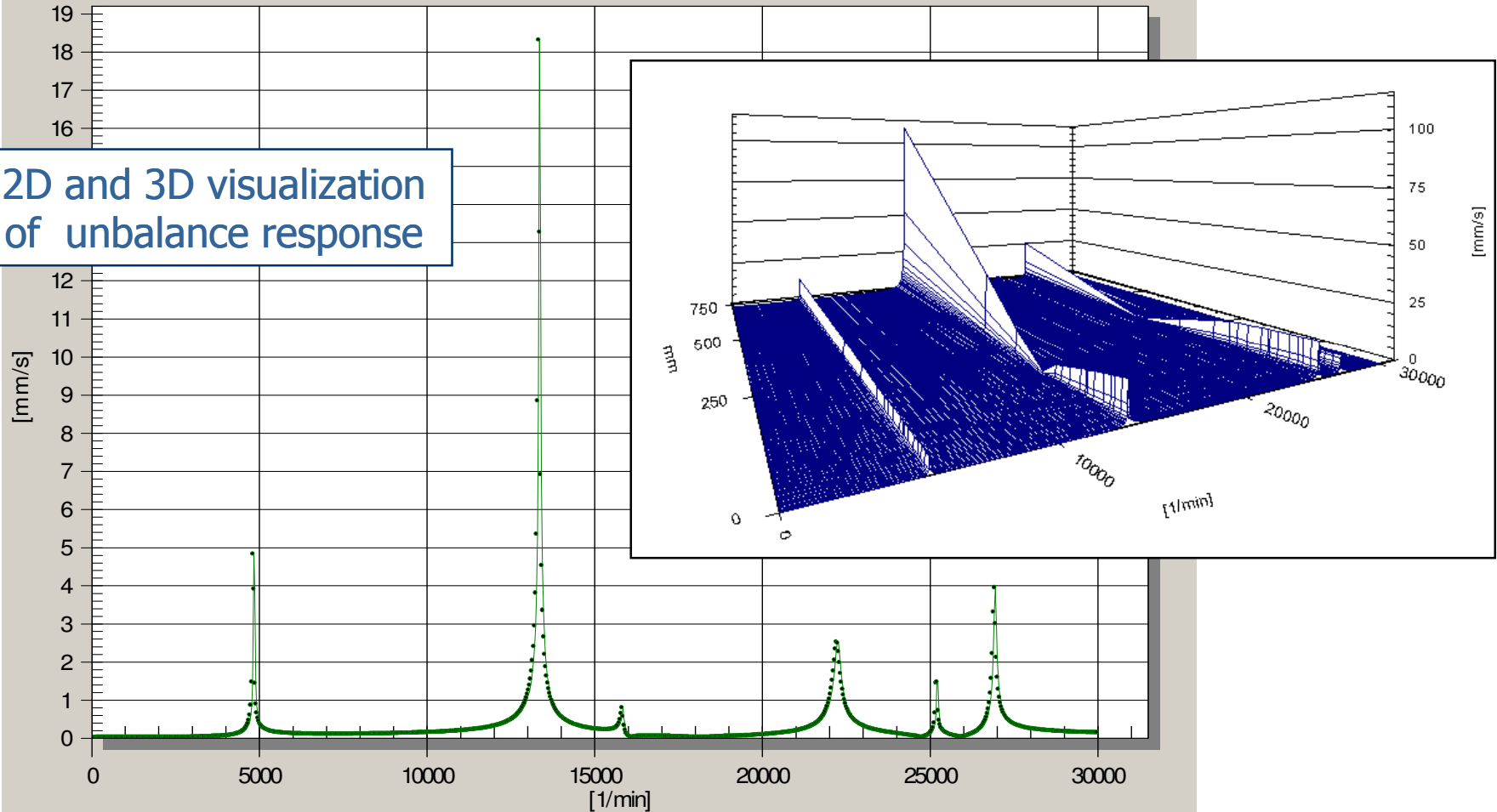


Unbalance response

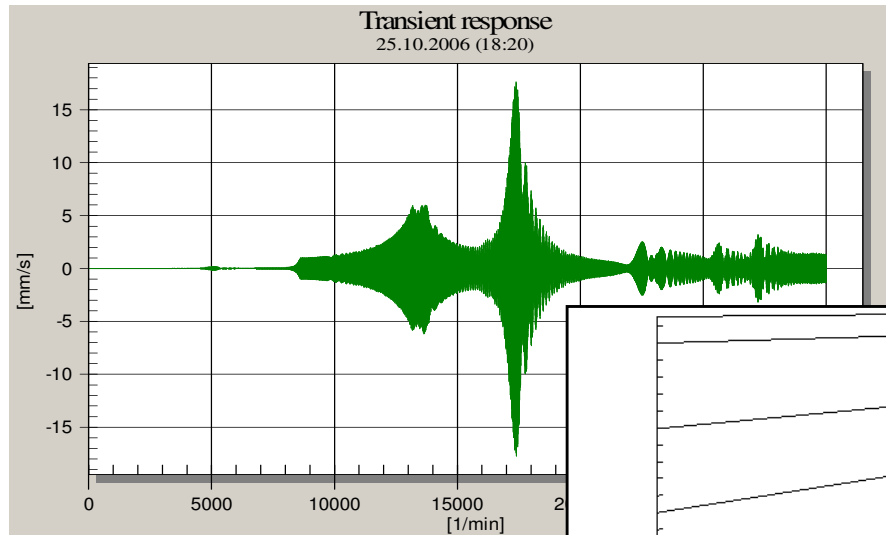


Unbalance response
25.10.2006 (16:46)

2D and 3D visualization
of unbalance response



Transient solution



*Dynamic response of outer case
(station <Rear PT support >)
GP turbine imbalance 1gsm;
PT turbine imbalance 1gsm;
Compressor imbalance 1gsm*

