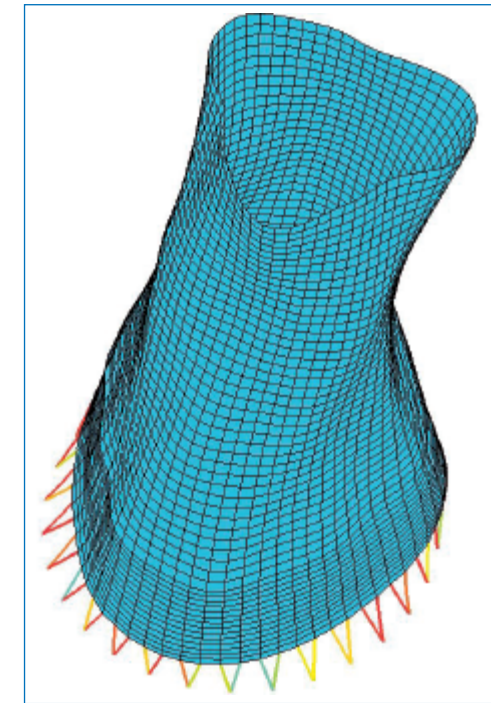
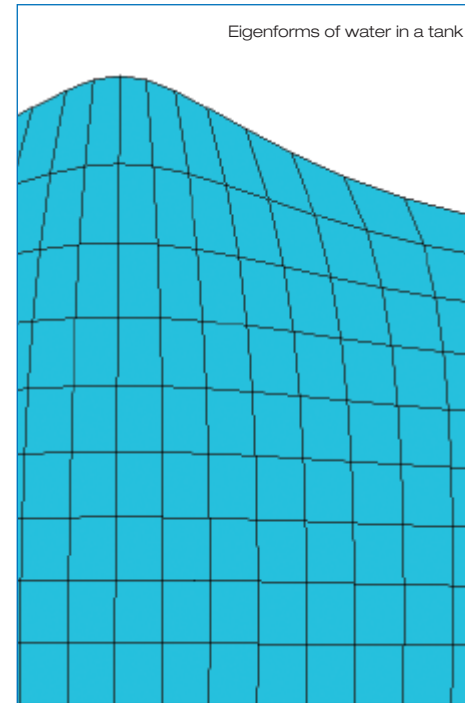


SOFISTIK offers two programs to solve dynamic problems.

DYNA is the stand-alone tool for linear dynamics and seismic analysis & design. ASE (Modules 1/2) offers Eigenvalues and time-step method.

- State-of-the-art solvers: sparse solver, iterative conjugate gradient solver (PCG)
- Eigenfrequencies
- Time Step Method with direct integration of equation of motion
- Integration of the motion equation through superpositioning of the Eigenforms (even for 3D continua)
- Stationary or Spectra-induced oscillation
- Eigenvalue Solver: simultaneous Vector iteration / Lanczos / Rayleigh
- Consistent or diagonalized mass- and damping-matrices
- Consistent consideration of excentricities also for mass matrices
- Geometric stiffness and buckling Eigenvalues, effective length
- Single masses (incl. off-diagonal entries)
- 3D beams incl. uniform and warping torsion
- Truss- and cable elements
- Spring-, boundary- and FLEX elements
- Damper elements
- 3D-shell elements
- 3D-continuum elements (only via ASE)
- Response Spectra accd. to EC8, DIN 4149 alt/neu, Ö-Norm B 4015, SIA 160, UBC, IBC, Indian Standard 1893, Chinese GBJ 11.89, SNIP
- Correctly signed superpositioning of corresponding forces with the spectra
- SRSS and CQC-Superpositioning, absolute addition
- Stationary response with frequency response (dynamic stiffness)
- Groups with variable damping characteristics
- Non-linear damping
- Time-History with Modal Analysis

- Time-History with Direct Analysis
- Evaluation of maxima and time dependend integration
- Evaluation of the response spectra with DYNR
- Wind-History integration with SOFILOAD-WH
- Vehicle-Structure-Integration, moving loads, High-Speed trains
- Dynamic contact problems
- Animated movies for transient and steady movement analysis of maximum base shear for the time history loading
- Scale factors for ground acceleration for time history loading
- Time history analysis with blast loading and multiple arrival times for multiple vibrational sources
- Harmonic load generator
- Combination of dynamic forces with static loading for subsequent design
- Missing mass for response spectrum load cases
- Modal damping for time history and spectrum
- Base shear analysis includes direction factors
- Extraction of frequency and mode shapes
- Modal damping ratio for individual modes
- Push-Over Analysis



**Non-Linear Wind Analysis**

The modules SOFILOAD-W (Wind), SOFILOAD-WH (Wind History) extends the dynamics analysis modules DYNA and ASE in solving complex non-linear wind analysis tasks for civil and structural engineering.

Following complex effects for the wind analysis are taking into account:

- Wind climate (Global Wind)
- Topology and roughness of the terrain (Local Wind)
- Aerodynamics, Aeroelasticity with drag coefficients and wind force derivatives
- Structural Dynamics (Response of the Structure)
- Design of the Structure

**Capabilities SOFILOAD -W**

- Determination of wind profiles considering the surface/terrain properties (e.g. roughness)
- Static wind loads on any Area-, Cable-, Formwork- and Truss Element
- Automatic consideration of the wind pressure values according following codes: DIN 1055, 1056, 4131-A, 4133-A, 4228, EC 1, VGB – BTR and the atmospheric wind
- Wind Zones with the atmospheric wind map

**Capabilities SOFILOAD -WH**

- Dynamic wind loads
- 10-Minute-wind simulations (time constant, but spatial variant basic mean wind)
- Wind spectra according to Karmann, Davenport, Harris, EC 1, Fichtl/McVehil, Simiu/Scanlan
- Analysis in ASE and DYNA with Wind-Structure-Interaction

