Release Notes

CDH/VAO Software
Version 4.1

September 2008

All the features described in these Release Notes are supported for Linux (64 bit) and Windows XP (32/64bit) platforms.

Matlab Version:

- CDH/VAO Version 4.1 requires Matlab Version 7.4.0 (R2007a) Service Pack 2

Operating System:

- Recommended Operating System and Graphic board:

Operating System:	CentOS release 4.4, Kernel: 2.6.9-42.EL for Linux Microsoft Windows XP Version 5.2 for Windows
Graphics board:	Nvidia
glVersion:	1.4.0 NVIDIA 43.63 or higher
QtVersion:	3.1 or higher

Installation:

- CDH/VAO Version 4.1 uses following environment variables to locate the software, license data and server:

HOME : user's home directory
HOST : hostname of computer running CDH/VAO
DISPLAY : variable for display
VAO_LICENSE : path of vao floating license file
VAO_HOME : installation path of vao program
VAO_SERVER : hostname of server running vao license daemon

VAO_NUTECH : (optional environment variable for using NuTech Optimizer), installation path of NuTech Optimizer program, a product of NuTech Solutions GmbH

- m-file vao_defaults.m:

Go to $VAO_HOME/mat, link 'vao_defaults.m' to 'vao_defaults.m-nastran' for users who use Nastran to calculate the modal data base of the original finite element model as well as the correction matrices for Submodel Shell- and Solid-Elements.

File 'vao_defaults.m-permas' is for users who use Permas to generate VAO modal data base and the correction matrices for Submodel Shell- and Solid-Elements.

New Features in the VAO release Version 4.1:

- New Submodels: Bush, Rod, Visc and Solid

In addition to the current Submodels Shell, Beam, Spring, Absorption and Damper, User can also specify following elements as Submodel:

-Bush element
-Rod element
-Visc element
-Solid element

Following examples show the definition format:

```
BEGIN bush element
        SM_name = 'Cbush_p711'
        SM_pid  = 711;
        SM_var = 'D_RK1;D_RB1'
        SM_type = 'bush'
        SM_calc ='E_K1=O_K1*(1+D_RK1); E_B1=O_B1*(1+D_RB1);'
        SM_var_value = [0 0];
        SM_var_min =  [-0.2 -0.2];
        SM_var_max =  [0.2 0.2];
        SM_var_start=SM_var_value
END
```

The available design parameters for Submodel Bush are:
E_K1, ..., E_K6, E_B1,...,E_B6, E_GE1,...,E_GE6

```
BEGIN rod element
        SM_name = 'Rod_p51'
        SM_pid  = 51;
        SM_var =  'D_E_51'
        SM_type = 'rod';
        SM_calc = 'E_E=D_E_51;'
        SM_var_value = 202000.0;
        SM_var_min = 0.8*SM_var_value;
        SM_var_max = 1.2*SM_var_value;
        SM_var_start=SM_var_value;
END
```

The available design parameters for Submodel Rod are:
E_A, E_J, E_NSM, E_E, E_RHO

```
BEGIN visc element
        SM_name = 'Cvisc_p61'
        SM_pid  = 61;
        SM_var =  'D_CE_61;D_CR_61'
        SM_type = 'visc'
```

```
        SM_calc = 'E_CE=D_CE_61;E_CR=D_CR_61;'
        SM_var_value = [6.2 3.94];
        SM_var_min  = 0.8*SM_var_value;
        SM_var_max = 1.2*SM_var_value;
        SM_var_start = SM_var_value
END
```

The available design parameters for Submodel Visc are:
E_CE, E_CR

```
BEGIN solid element
      SM_name = 'Solid_p44'
      SM_pid  = 44;
      SM_var = 'D_GE_44'
      SM_type = 'solid'
      SM_calc = 'E_GE=D_GE_44;'
      SM_var_value = 0.2;
      SM_var_min  = 0.8*SM_var_value;
      SM_var_max = 1.2*SM_var_value;
      SM_var_start = SM_var_value
END
```

The available design parameters for Submodel Solid are:
E_E, E_RHO and E_GE

Note: For the submodel definition with new type, the current version supports the submodel batch generation capability only.

- Interface to Permas excitation LPAT

  VAO can convert Permas load input directly to CDH/VAO load input, this can be done in menu <VAO Main Menu>/<Tools>/<Preprocessing> /<Input Interface>/<PERMAS Interface>/<Excitation: PAT->*.mat>.

- Standard Deviation as input for cost function

  In Optimisation with Beta-Method user can also take the standard deviation of frequency responses to define cost function.

  The input variable 'sub' for the cost function has two additional fields 'sub.s_sd' and 'sub.f_sd' to specify the standard deviation of structure and fluid frequency responses, respectively.

- Shell-SM-Permas Interface

  User can also use Permas to generate correction matrices for Submodel Shell-elements.

- Structure Mode to Fluid Grid Participation Factors

This feature is available in menu <VAO Main Menu>/<Full Model> /<Coupled Operation>/<Frequency Response>/<Structure Mode to Fluid Participation>.

- New visualisation mode in Viewer

  Vaoviewer has a new additional visualisation mode called skeleton structure, which draws only edges of elements.

- Modification and Improvement:

  New control menu and 3D plot have been added to the feature "Panel Participation Factors".

  The sub-menus of <Coupled Operation> have been re-organized. The frequency responses calculation of coupled operation will be done in menu <VAO Main Menu>/<Full Model>/<Coupled Operation>/ <Frequency Response>/<Physical Response> with new control input dialog. The input dialog for FRF of uncoupled operation has been extended with the option for FRF-output in Plots or ASCII data or both.

  The feature "Optimisation Beta Method" has been removed and the feature "Optimisation Beta Multi-Load (ML) Method" is now available in menu <VAO Main Menu>/<Optimisation>/<Beta-Method>.

  Furthermore, the method for saving/loading Submolde correction matrix, the scrollbar technique for displaying Submodel and Design parameters and the scrollbar technique for Force Generation have been improved.