

Coustyx

NVH software for multi-pole acoustics analysis

Coustyx is a next generation acoustic analysis software that combines fast multi-pole technology with boundary element method. Advancements in Coustyx allow you to perform fast NVH analysis on very large models (1 million unknowns) over a broad frequency band ($ka=0.01$ to 300). Intuitive, feature-rich Graphical User Interface makes model setup effortless, saving you time and money.

Benefits

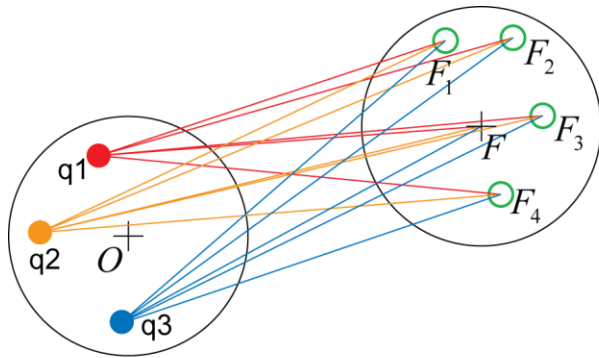
- Built on FMM-BEM technology
- Large models (1 million unknowns)
- Fast, accurate solutions (50x faster)
- Broad frequency band ($ka=0.01$ to 300)
- Multi-core implementation with linear speedup
- Intuitive GUI
- Translators for commonly used FEA data formats
- Effortless model setup
- Integrated pre/post processors
- Great value for money
- Responsive technical support

Features

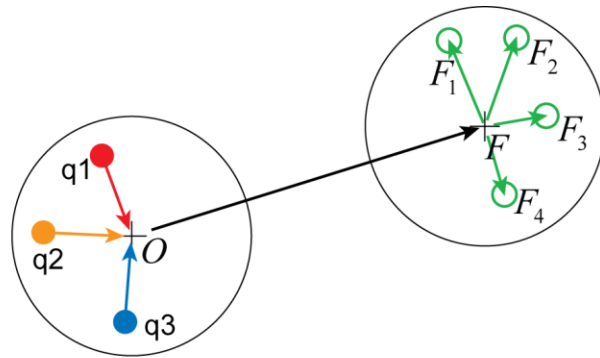
- Interfaces: Optistruct/Radioss, Nastran, Ansys, Abaqus, Universal files
- Mesh preparation tools: skinning, fill holes, stitch gaps, flip elements, create or delete elements
- Wide selection of boundary conditions
- Acoustic-structural coupling
- Robust BEM formulations: Collocation, Variational, Burton-Miller Galerkin
- Multi-domain implementation
- Scripting and Batch mode support
- Automatic creation of jumps & junction constraints
- Acoustic sources built-in

What is the Fast Multi-pole Method (FMM)?

FMM is an efficient way to compute the far field caused by a collection of acoustic sources. A set of closely located sources are grouped together as a single multi-pole source, for computing far field response. The far field response is then expanded to obtain responses at nearby points. This powerful idea has been used in a number of disciplines from gravitational to elasticity. Coustyx integrates FMM with Boundary Element Method (BEM) to obtain rapid solutions to acoustic problems. The small memory foot print of Coustyx along with fast solvers allows us to solve large acoustic problems.



a. Direct Computation



b. Single Level FMM Computation

Benchmarks

Problem Size	Memory Required	Solution Time
10 K	159 MB	6 Sec
20 K	575 MB	11 Sec
50 K	968 MB	19 Sec
100 K	1.8 GB	31 Sec
200 K	3.6GB	1.2 Min
500 K	8.6 GB	3.0 Min

ISO Standards Supported

Standards	Description	Measurement Surfaces
ISO 3744 (1994 standard)	<ul style="list-style-type: none"> Engineering grade Uses sound pressure levels 	<ul style="list-style-type: none"> Hemisphere, Quadrant, Octant Parallelepiped
ISO 3745 (2003 standard)	<ul style="list-style-type: none"> Precision grade Uses sound pressure levels 	<ul style="list-style-type: none"> Sphere Hemisphere
ISO 9614-1 (1993(E) standard)	<ul style="list-style-type: none"> Precision, Engineering & Survey grades Uses normal sound intensity 	<ul style="list-style-type: none"> Hemisphere Parallelepiped



Altair Engineering, Inc., World Headquarters: 1820 E. Big Beaver Rd., Troy, MI 48083-2031 USA
 Phone: +1.248.614.2400 • Fax: +1.248.614.2411 • www.altair.com • info@altair.com