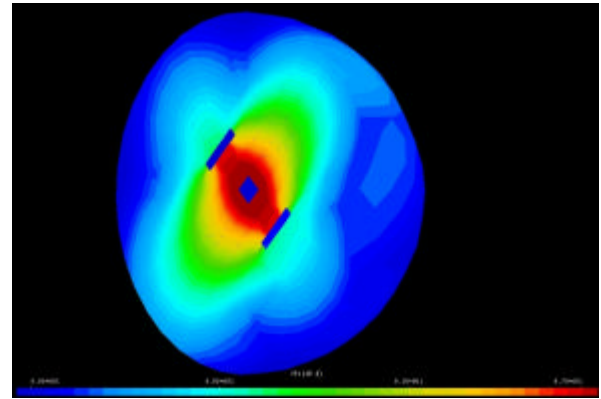
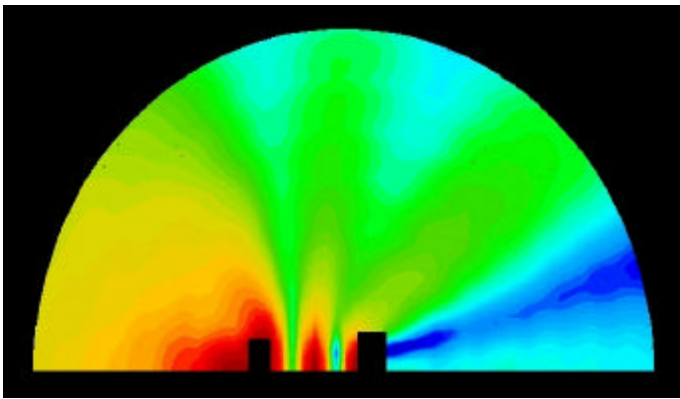


SIMULATION OF INDUSTRIAL AND VEHICULAR NOISE PROPAGATION

fluidyn -dB is designed to simulate the impact of noise pollution on the surrounding environment from noise sources such as existing or planned constructions, highways, factories etc.



Simulation of noise propagation in presence of wind and humidity:

- Vehicular traffic : design and management of acoustic barriers (buildings ...);
- Industrial noise : external and internal sound management in buildings

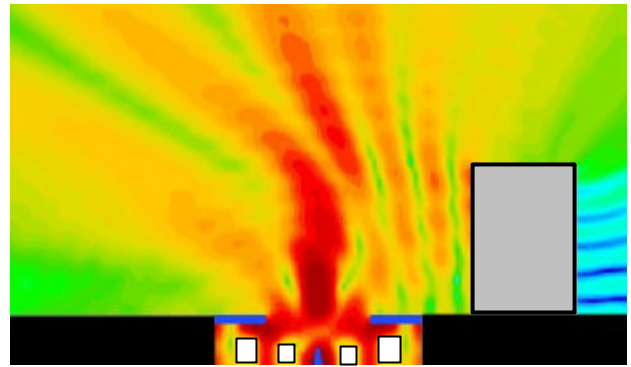
fluidyn -dB helps in predicting the noise levels due to single or multiple point sources or line type of noise sources. It can also be coupled with a back propagation acoustic model to model complex sources.

fluidyn -dB takes into account the effect of terrain features such as flat or hilly regions and the effects of man-made and natural barriers on the propagation of noise. Buildings and vegetation also affect the propagation of noise and their effects are also modeled in *fluidyn* -dB. Ground absorption coefficients (due to grass, snow) as well as absorption due to coatings on barrier surfaces are available in *fluidyn* - dB.

Meteorological conditions also play a significant role in noise propagation. *fluidyn* - dB takes into account the effects of wind velocity and humidity on the noise propagation

fluidyn - dB solves the Helmholtz equation for wave propagation using the finite element method. Far-field results (at distances far away from the source) are obtained by a specific module *fluidyn* -dB-Ray, based on a ray emission technique coupled with an acoustic beam propagation method. This method helps to simulate sound propagation at any number of far-field points in a precise manner.

fluidyn -dB is an integrated package comprising of a pre-processor, a solver and a post-processor. It is designed for use by city planners, environmentalists and industrials who may not have detailed knowledge of numerical methods. The entire process of simulation can be carried out by merely making appropriate choices out of a host of possible options offered by **fluidyn -dB**.



fluidyn -dB is a fully menu-driven package with extensive context sensitive on-line help.

METHODOLOGY

- 3D mixed formulation :
 - Near Field results by finite elements
 - Far field results by direct integration
- Noise Sources :
 - Direct or from databases (highways, train) point type of sources (industries, airplanes)
 - Complex by acoustic back propagation of on-site measurements.

ANALYSIS AND RESULTS

- Parameters : pressure, intensity and acoustic radiation in all domains, near field and far field
- Data, analysis, results integrated with the solver, possibility to modify the data during computation.
- Curves : SPL, pressure
- Animation
- Interactive presentation & manipulation

fluidyn -dB models include:

- **fluidyn -RAYdB** **Noise pollution from industries**
- **fluidyn -ROADdB** **Noise pollution due to road traffic**
- **fluidyn -AVNOISE** **Noise pollution in and around airports**

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