Flow over a building with elastic membrane roof

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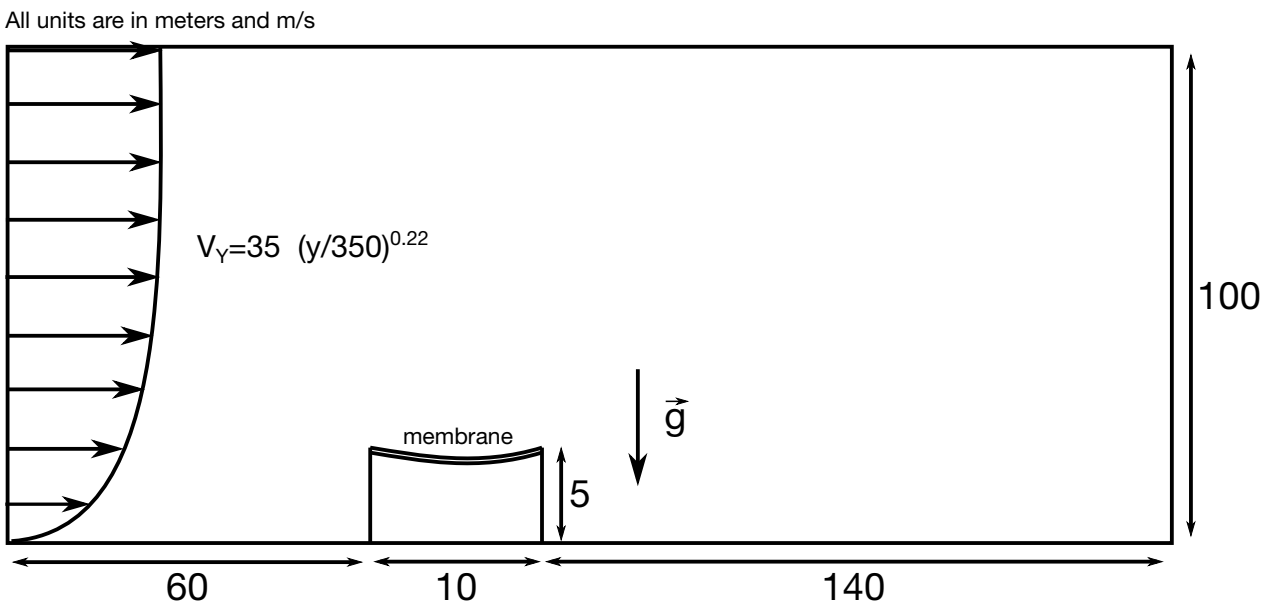
LSDYNA ICFD solver

Dev version SVN 109309

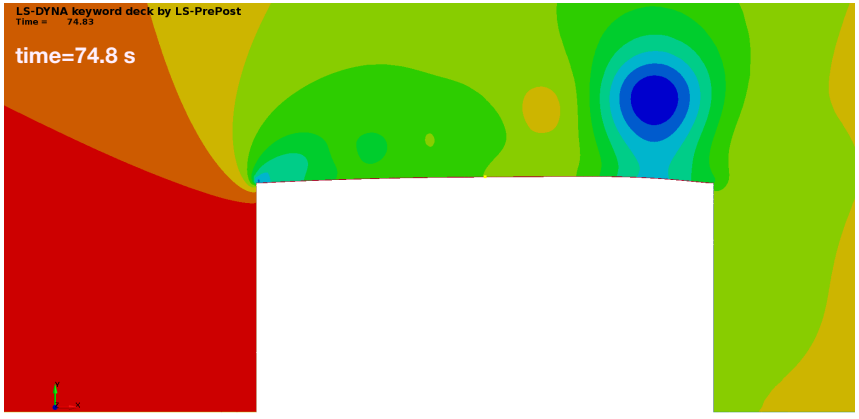
Case Description

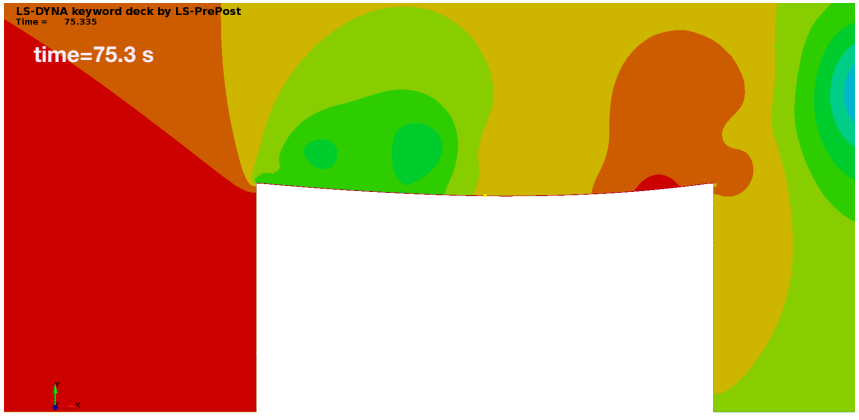
A viscous flow passes over a building preloaded by gravity. Non linear vibrations due to fluid structure interaction occur. The mesh size of the roof is made of 200 nodes and the chosen timestep is $0.005s$.

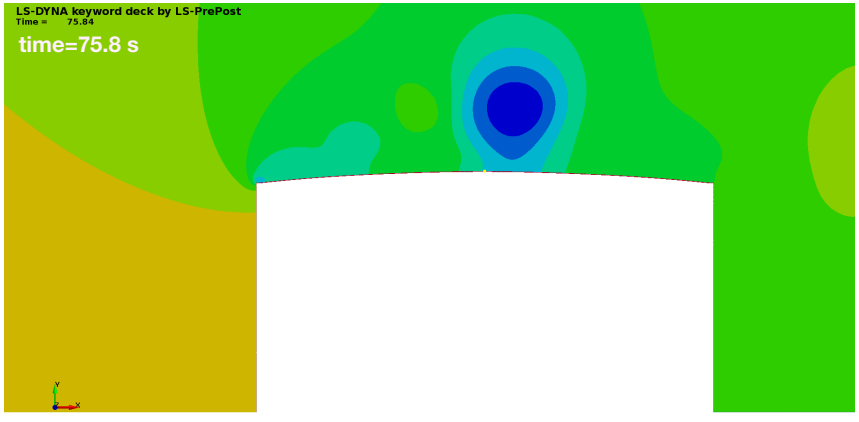
Quantity	Units	Value
ρ_f	$kg.m^{-3}$	1.25
μ_f	$Pa.s$	0.1
$roofthickness$	m	0.01
E	Pa	10^9
ρ_s	$kg.m^{-3}$	1000
ν	–	0.

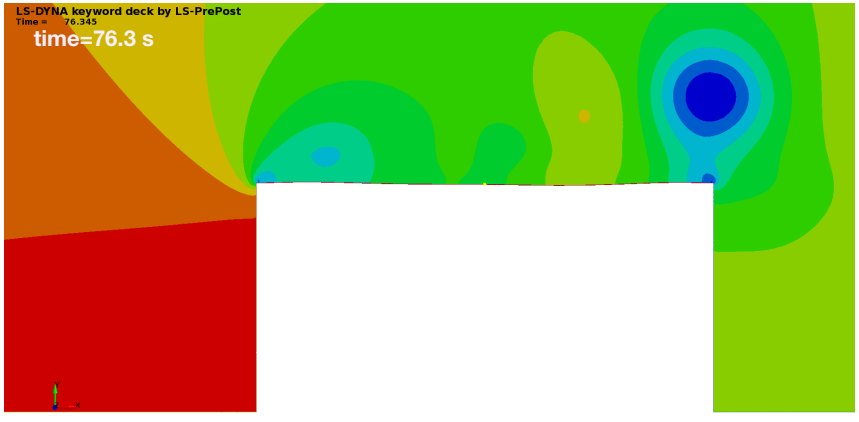


Pressure Fringes

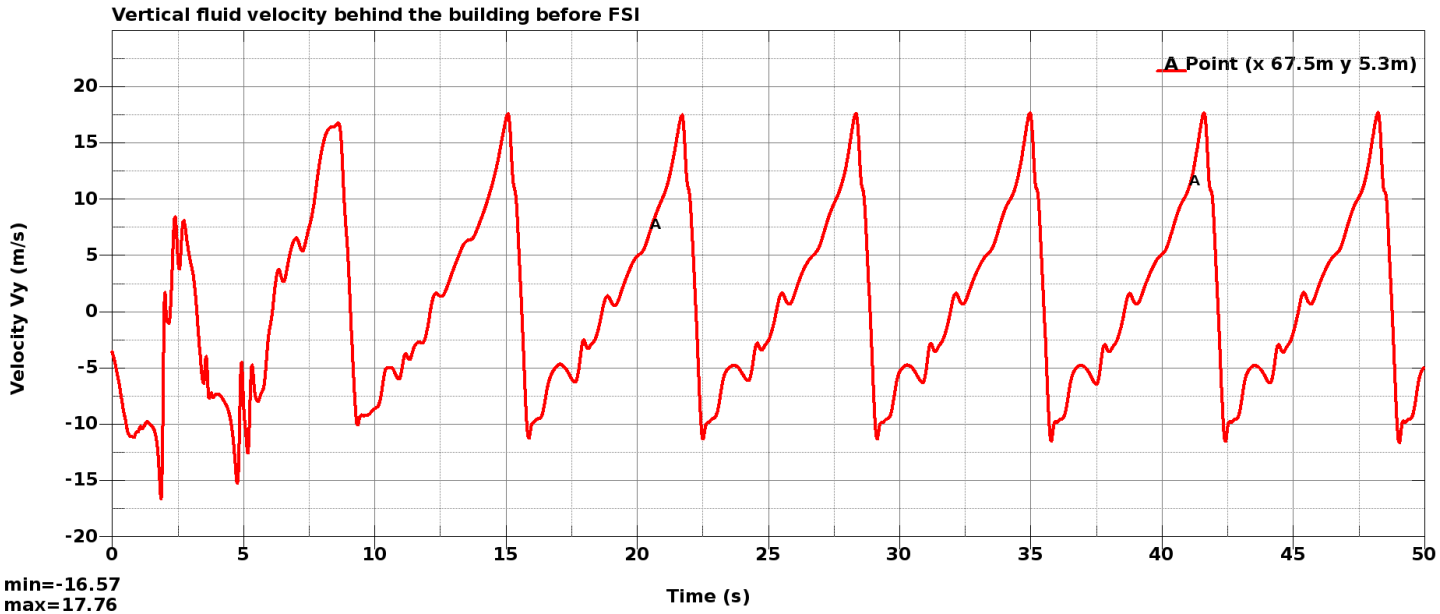


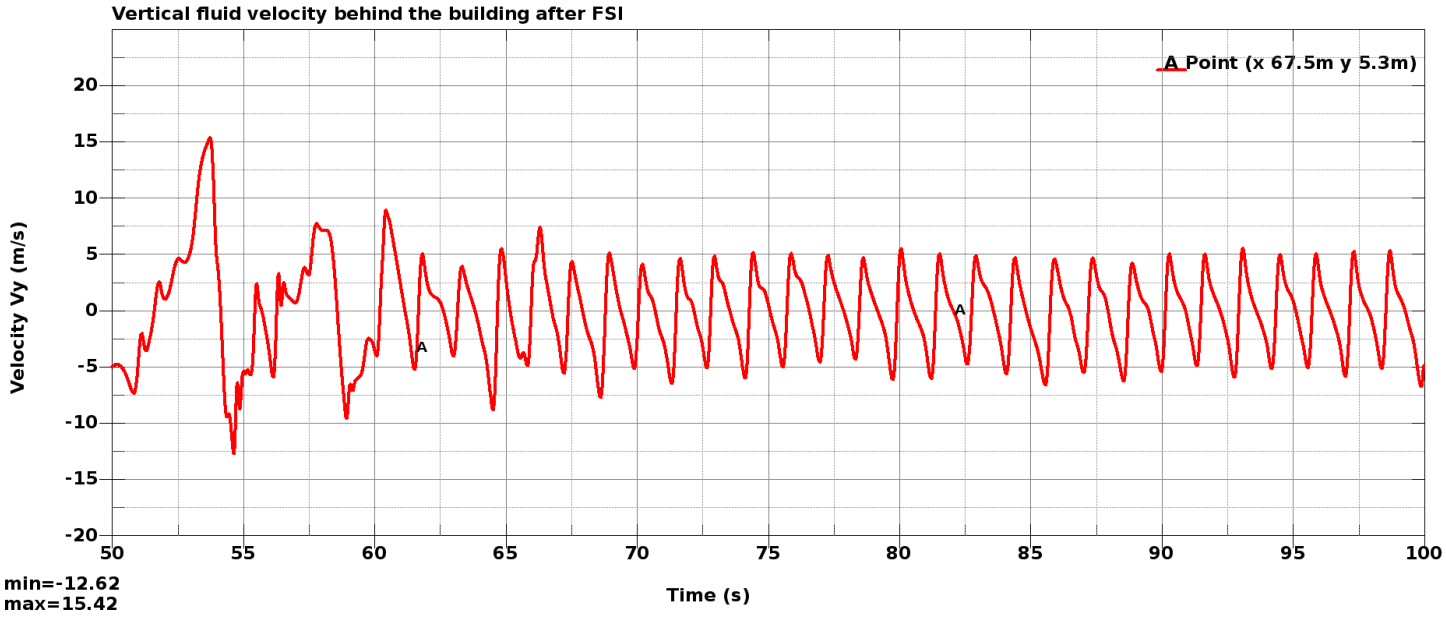




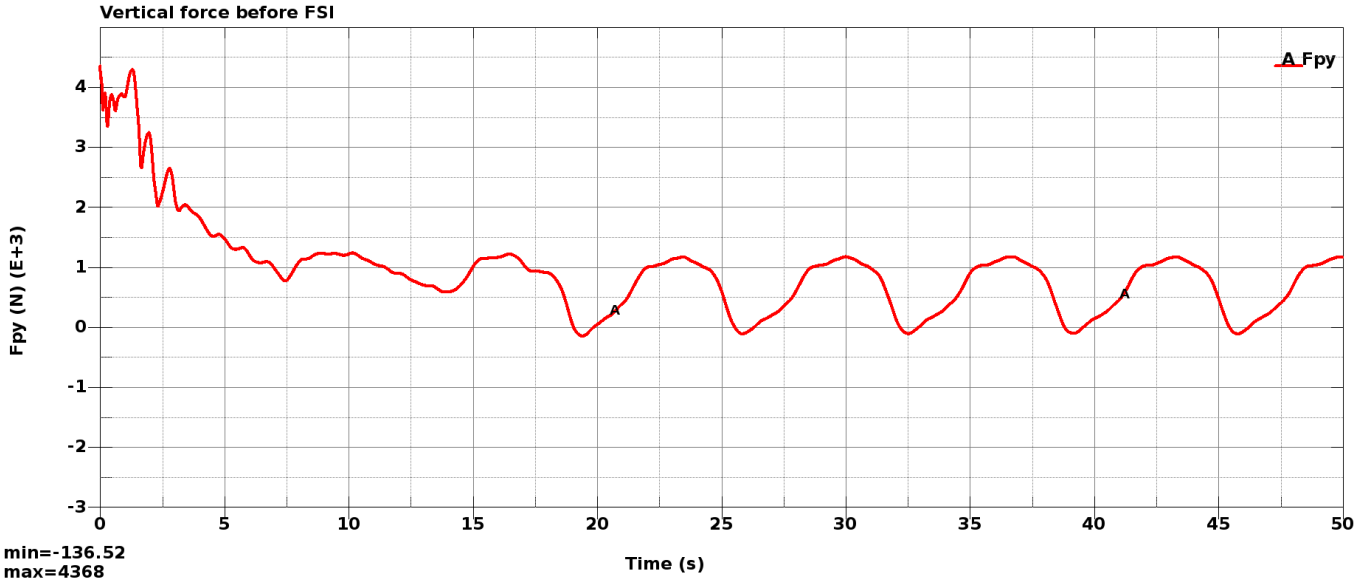


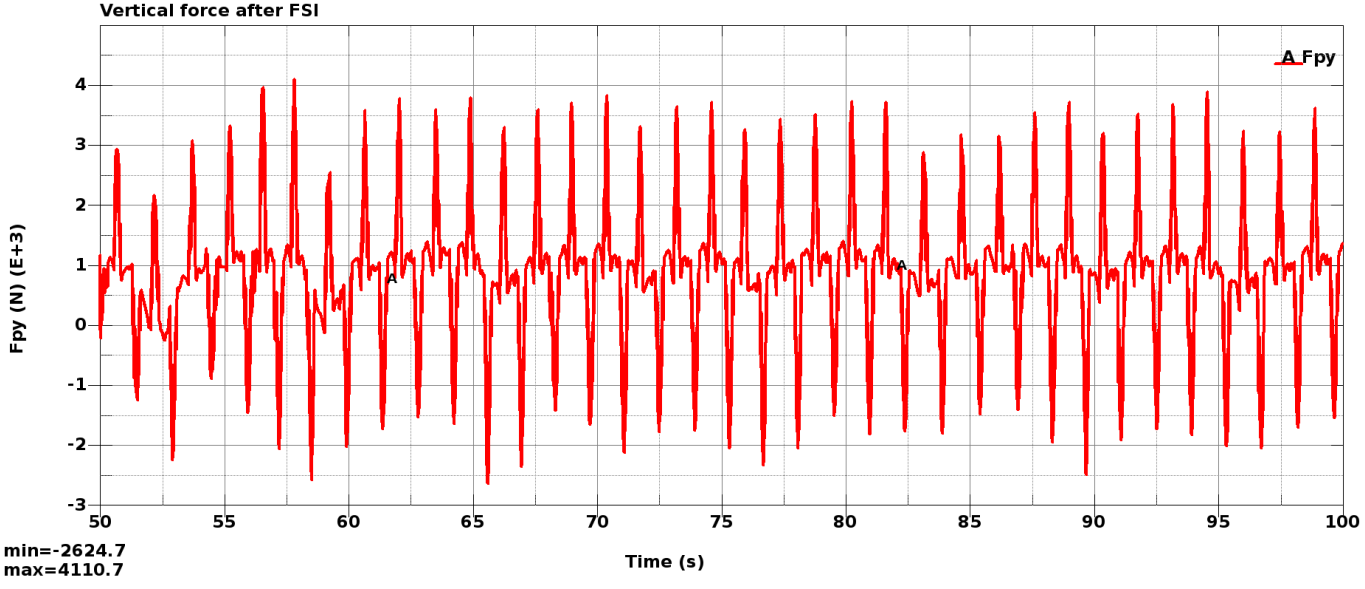
Results- Fluid Vertical Velocity behind the roof



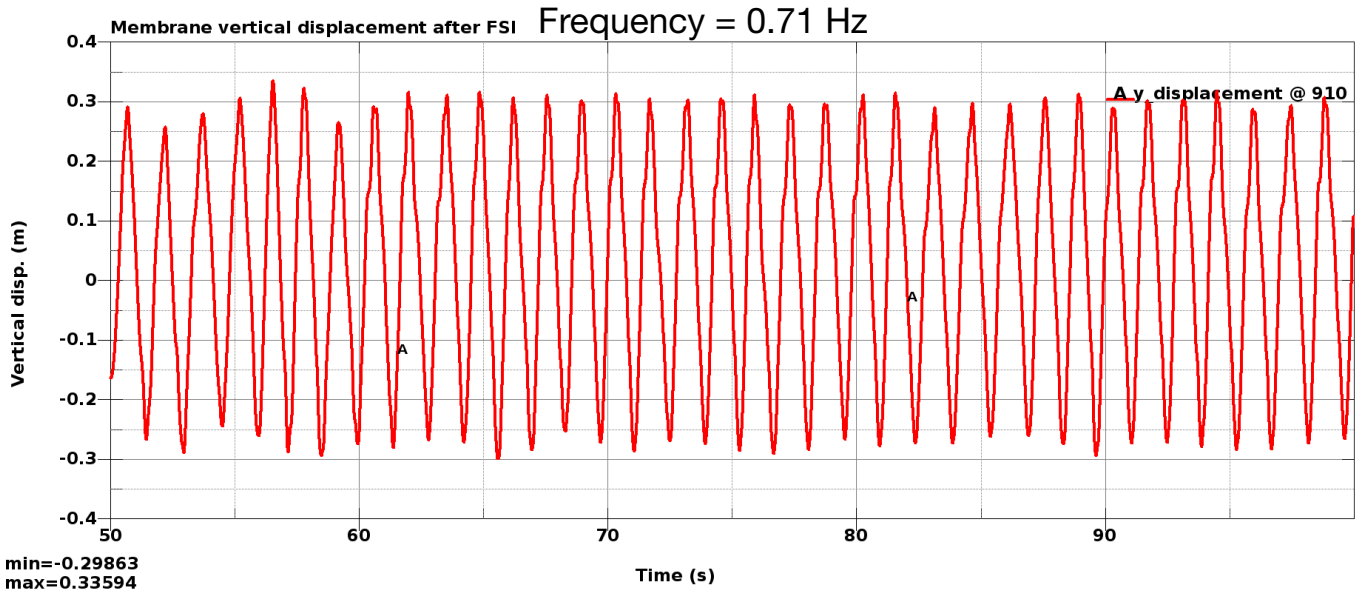


Results- Roof Vertical force





Results- Roof Vertical Displacements



References

[1] B. Hübner, E. Walhorn, and D. Dinkler, "A monolithic approach to fluid–structure interaction using space–time finite elements," *Computer Methods in Applied Mechanics and Engineering*, vol. 193, no. 23–26, pp. 2087 – 2104, 2004.

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