

LS-DYNA 在声学瞬态仿真中的应用

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2019第四届LS-DYNA国内用户大会

2019-10-21 ~ 2019-10-23

上海徐汇区上海中星铂尔曼大酒店



Livermore Software Technology Corp.

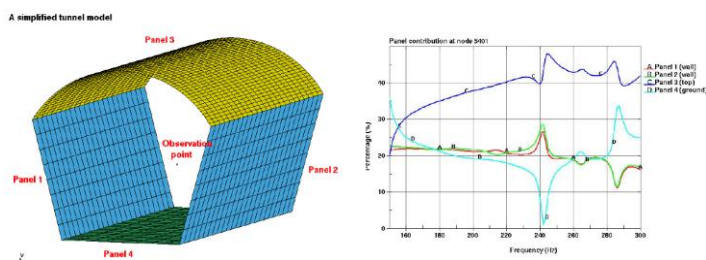


上海仿坤软件科技有限公司

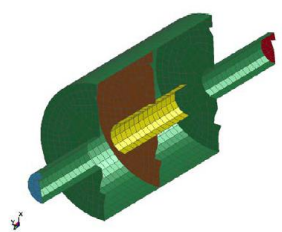
Autoliv

声学仿真

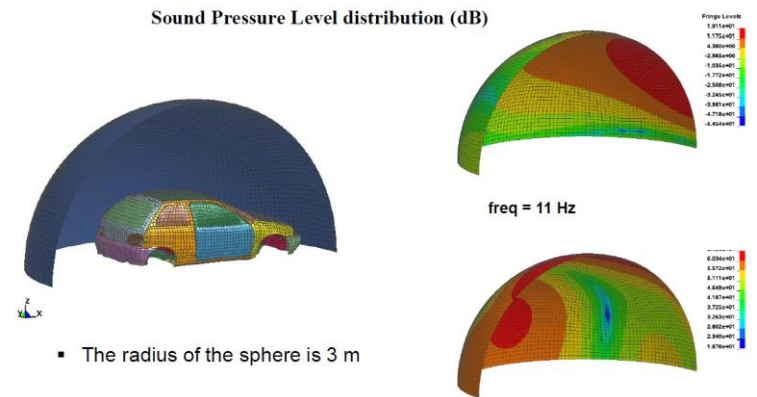
■ 频率声学分析 (图片来源: LSTC)



板块贡献量分析



消声量分析

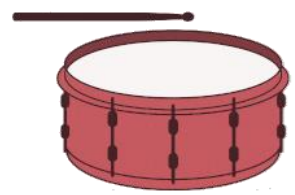
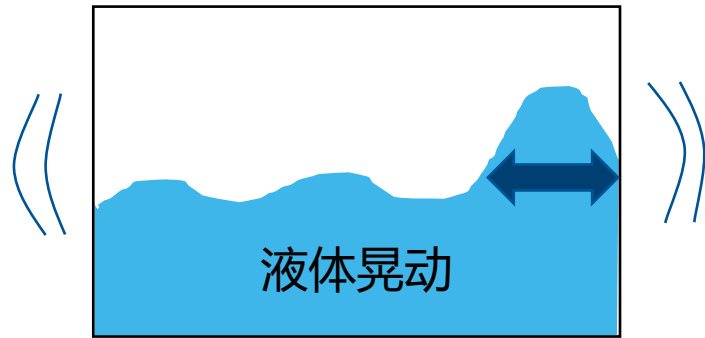


振动声辐射分析

■ 时域声学分析

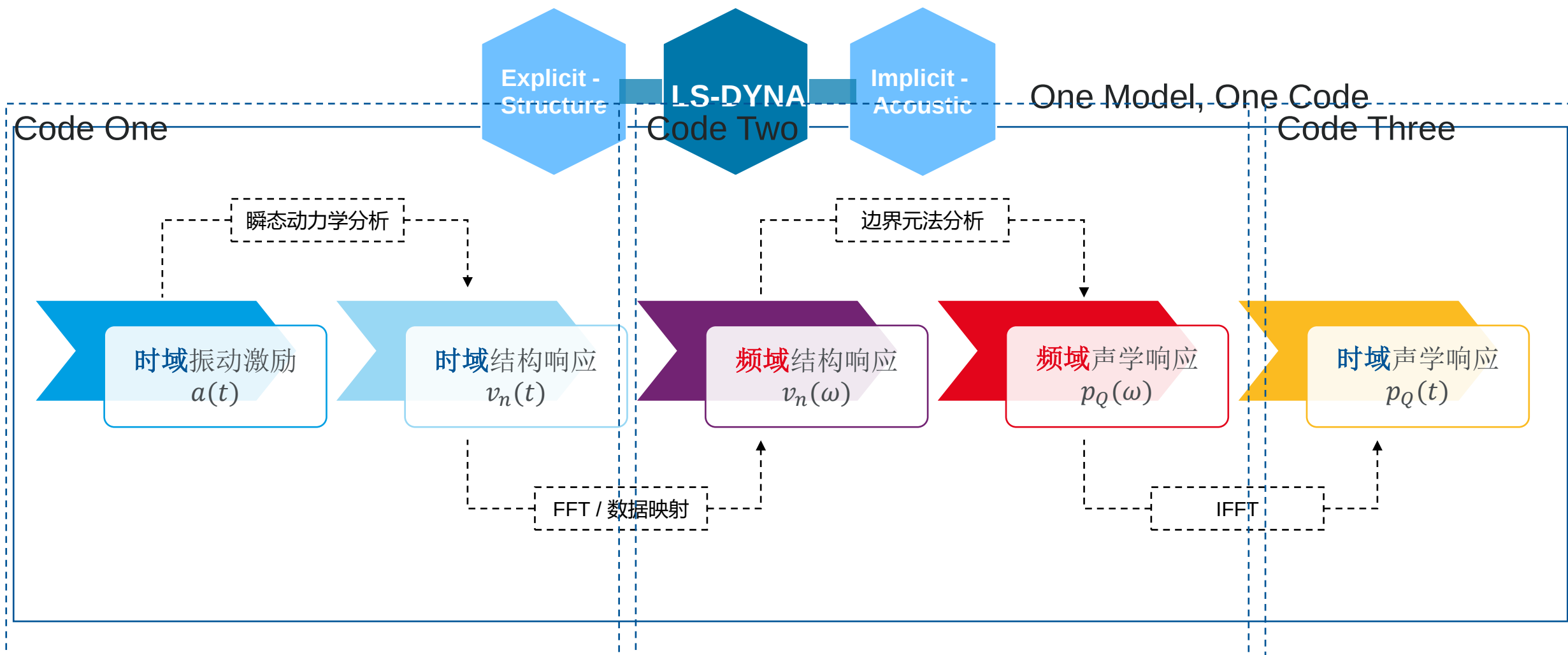


转速变化过程



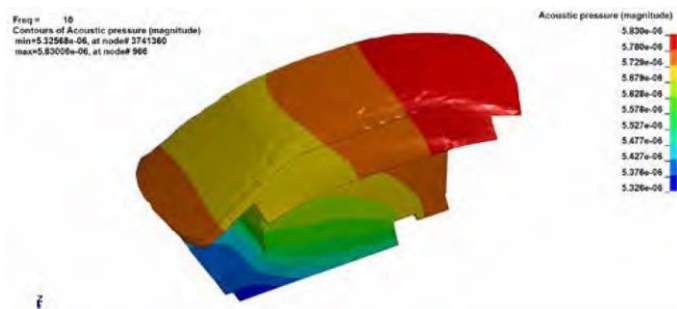
敲击、撞击、碰撞过程

瞬态声学仿真流程

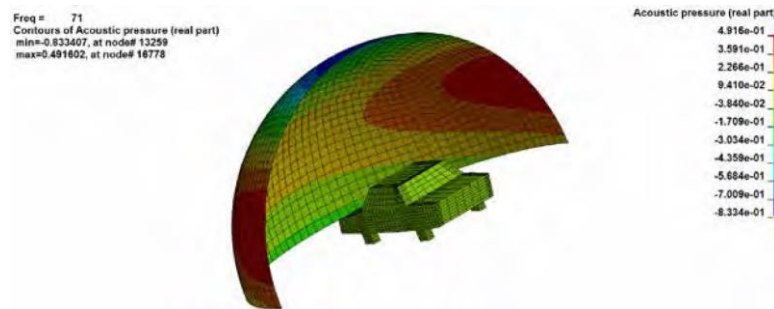


声学仿真输出

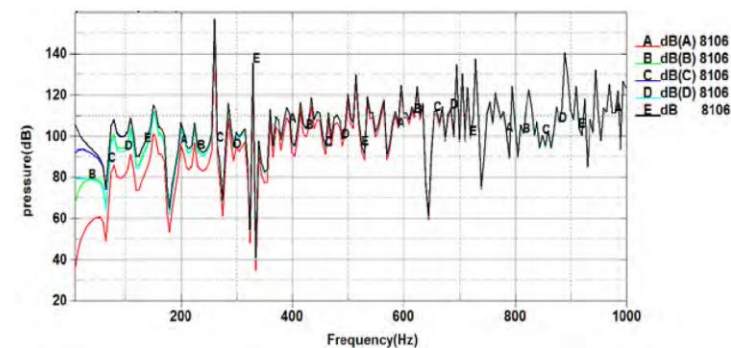
■ 频域



结构表面声压分布

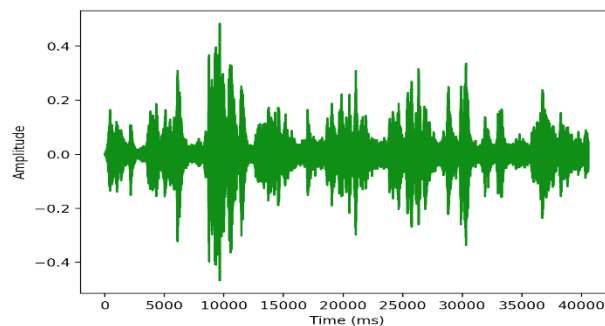


场内声压分布



场点声压频谱

■ 时域

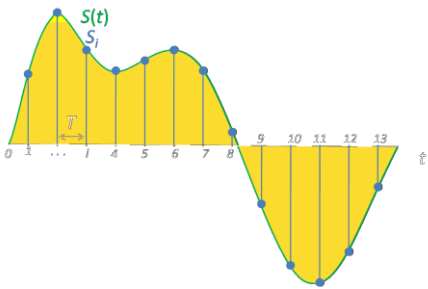


场点声压时间历程



可播放音频文件

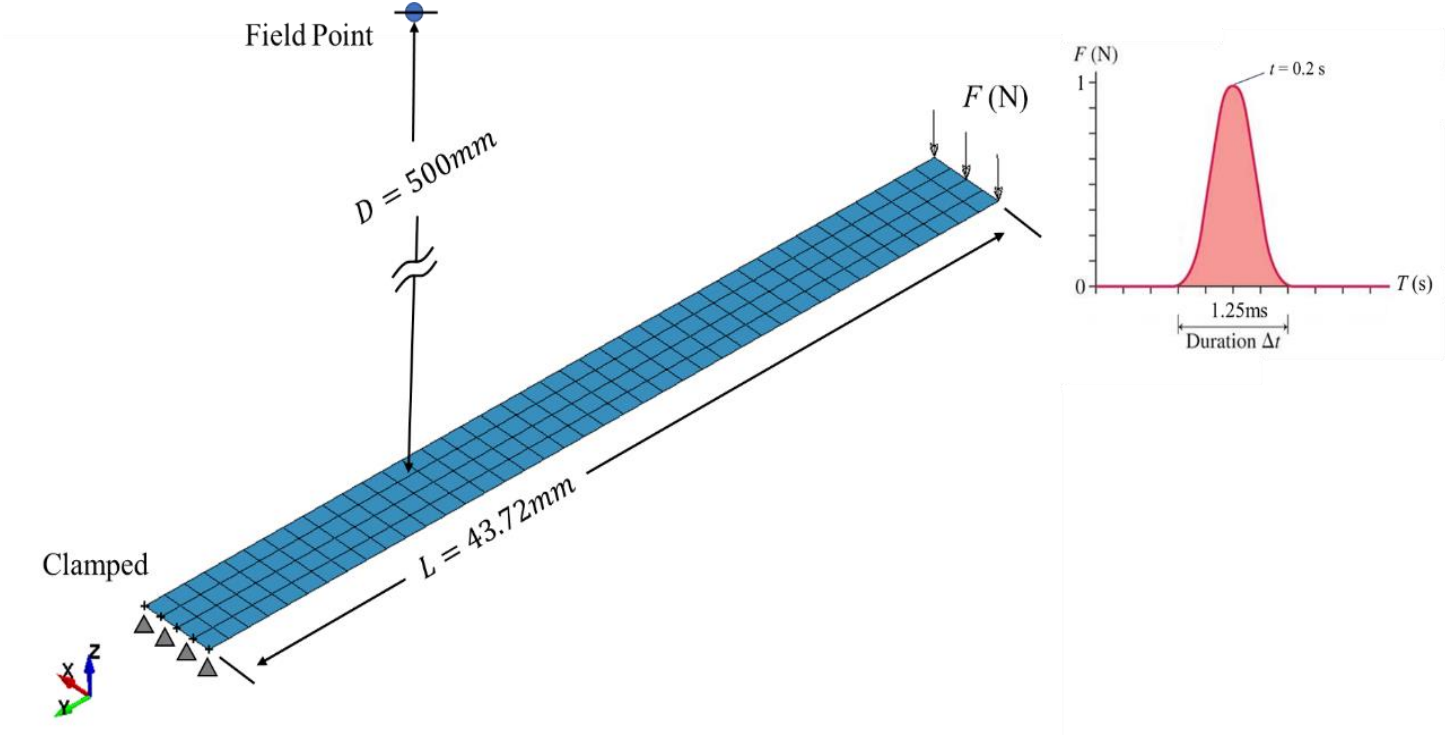
*FREQUENCY_DOMAIN_ACOUSTIC_BEM



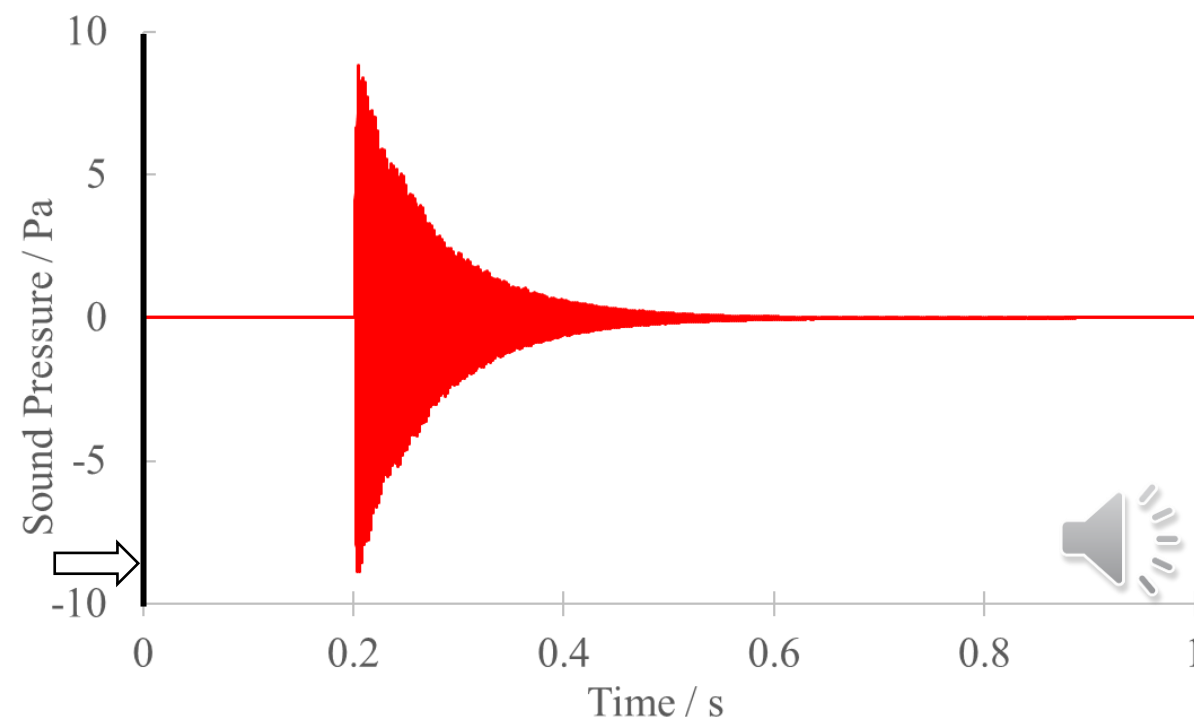
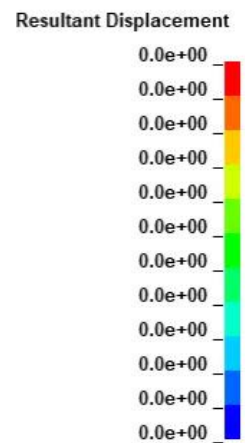
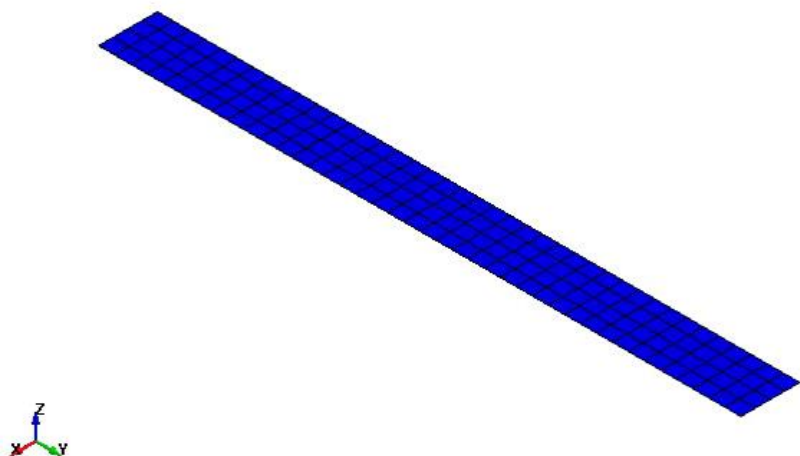
速度数据提取时间间隔 / 采样间隔

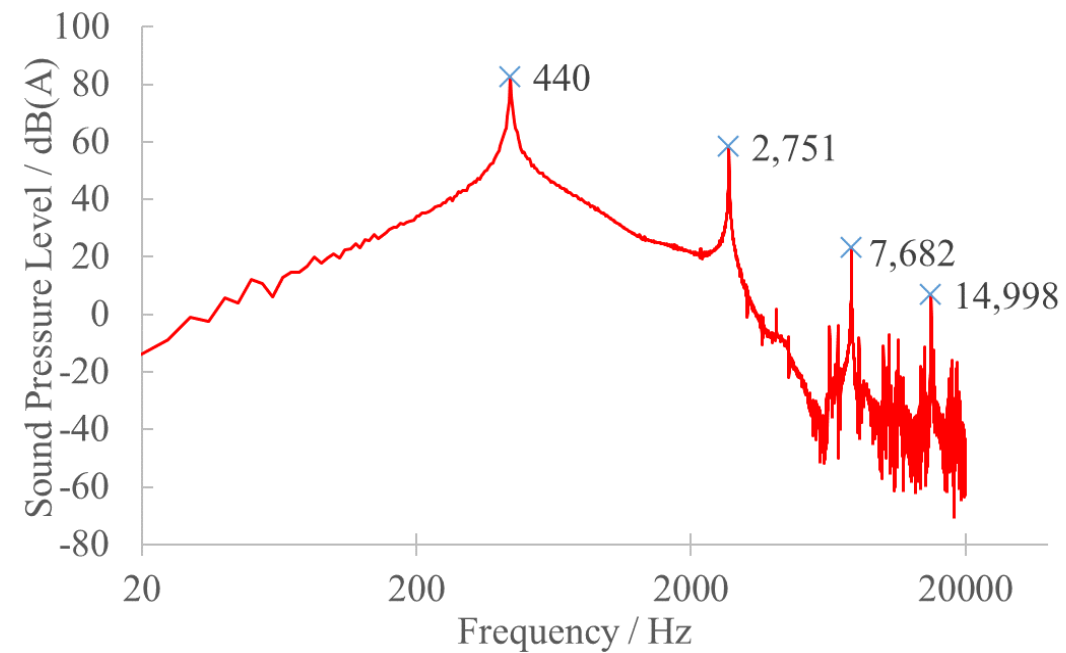
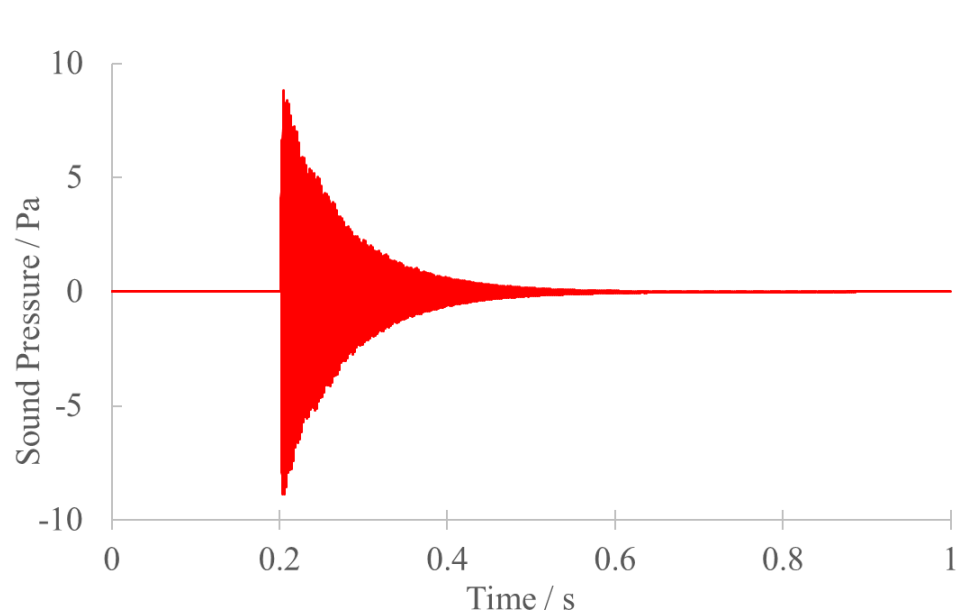
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	1.21	343	0	20000	4000	2.5e-5	0	2e-5
Card 2	NSIDEXT	TYPEXT	NSIDINT	TYPINT	FFTWIN	TRSLT	IPFILE	IUNITS
	3	1			0	2		
Card 3	METHOD	MAXIT	TOLITR	NDD	TOLLR	TOLFCT	IBDIM	NPG
	2							
Card 4		NBC	RESTRT	IEDGE	NOEL	NFRUP	VELOUT	DBA
		1						1
Card 5	SSID	SSTYPE	NORM	BEMTYPE	LC1	LC2		
	1	2						

仿真实例 1. 悬臂梁

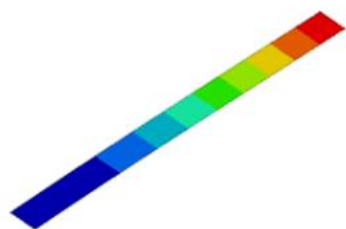


Time = 0.0039999
Contours of Resultant Displacement
min=0, at node# 42
max=0, at node# 42

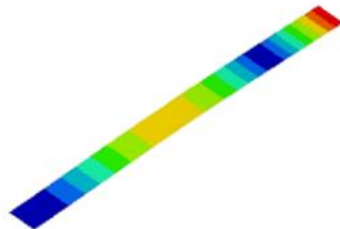




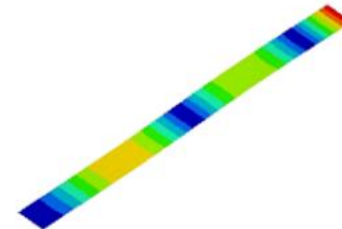
Mode #1, Frequency = 440Hz



Mode #3, Frequency = 2755Hz



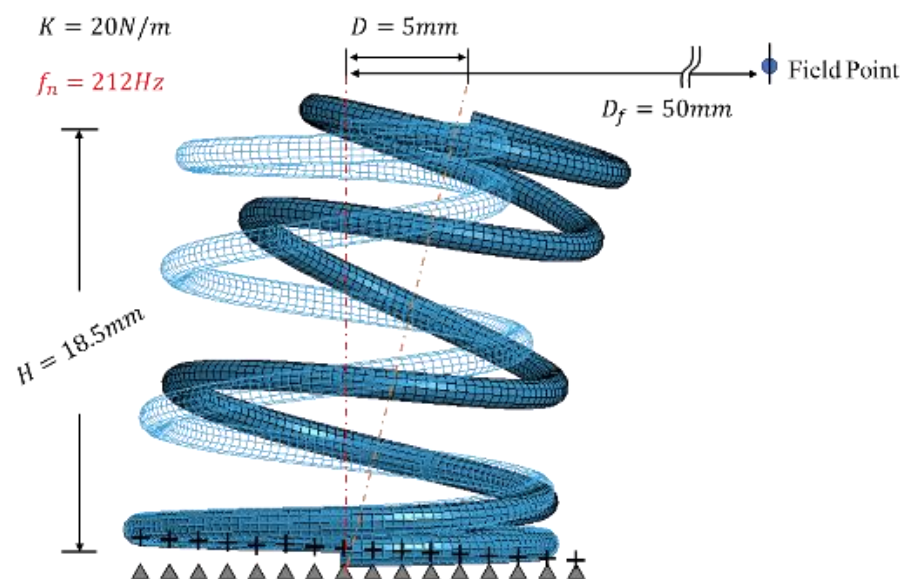
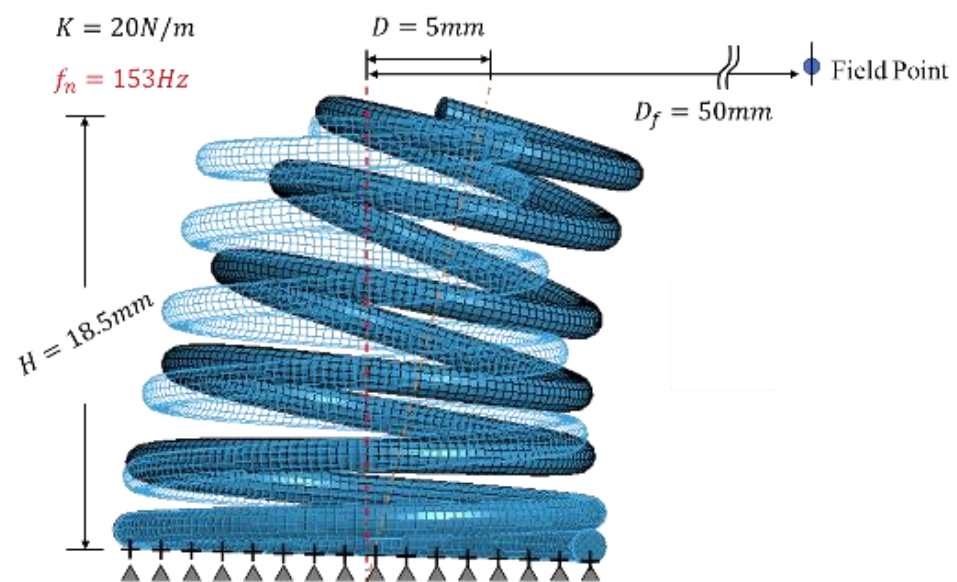
Mode #4, Frequency = 7705Hz



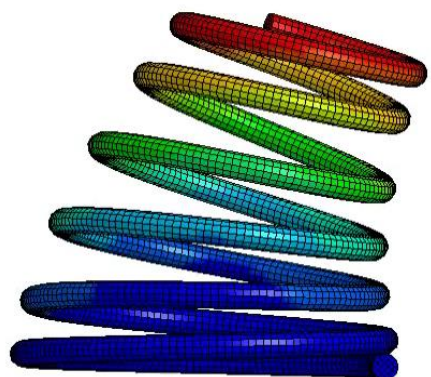
Mode #7, Frequency = 15075Hz



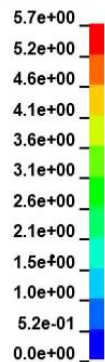
仿真实例 2. 圆柱弹簧



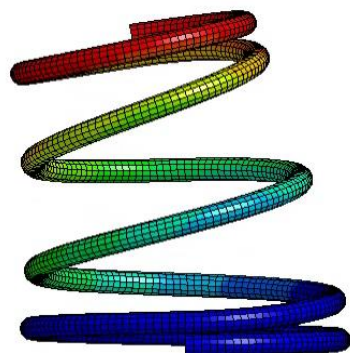
Time = 0
Contours of Resultant Displacement
min=0, at node# 18175
max=5.66947, at node# 2427



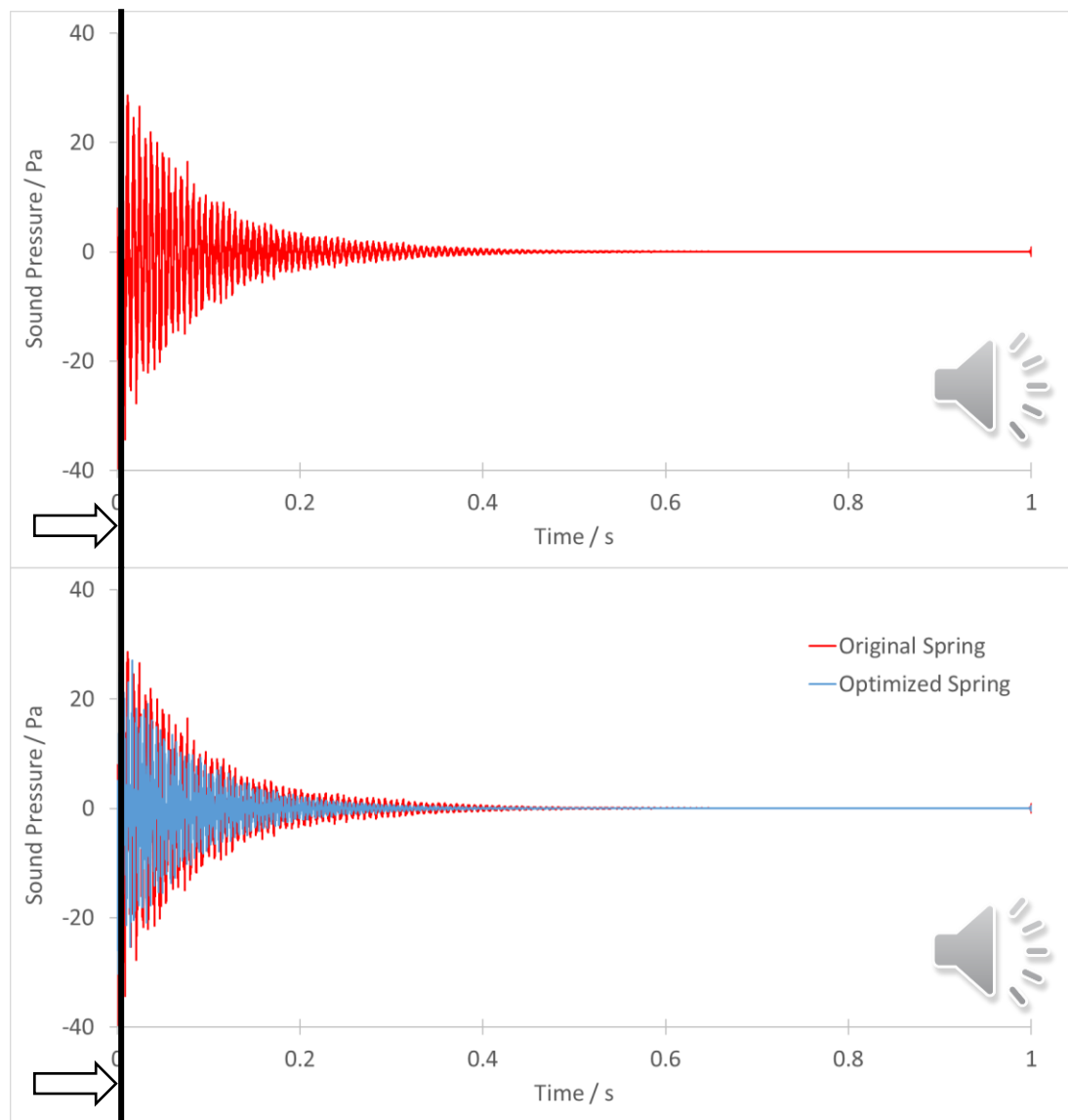
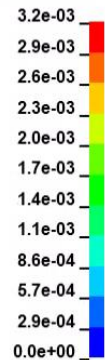
Resultant Displacement



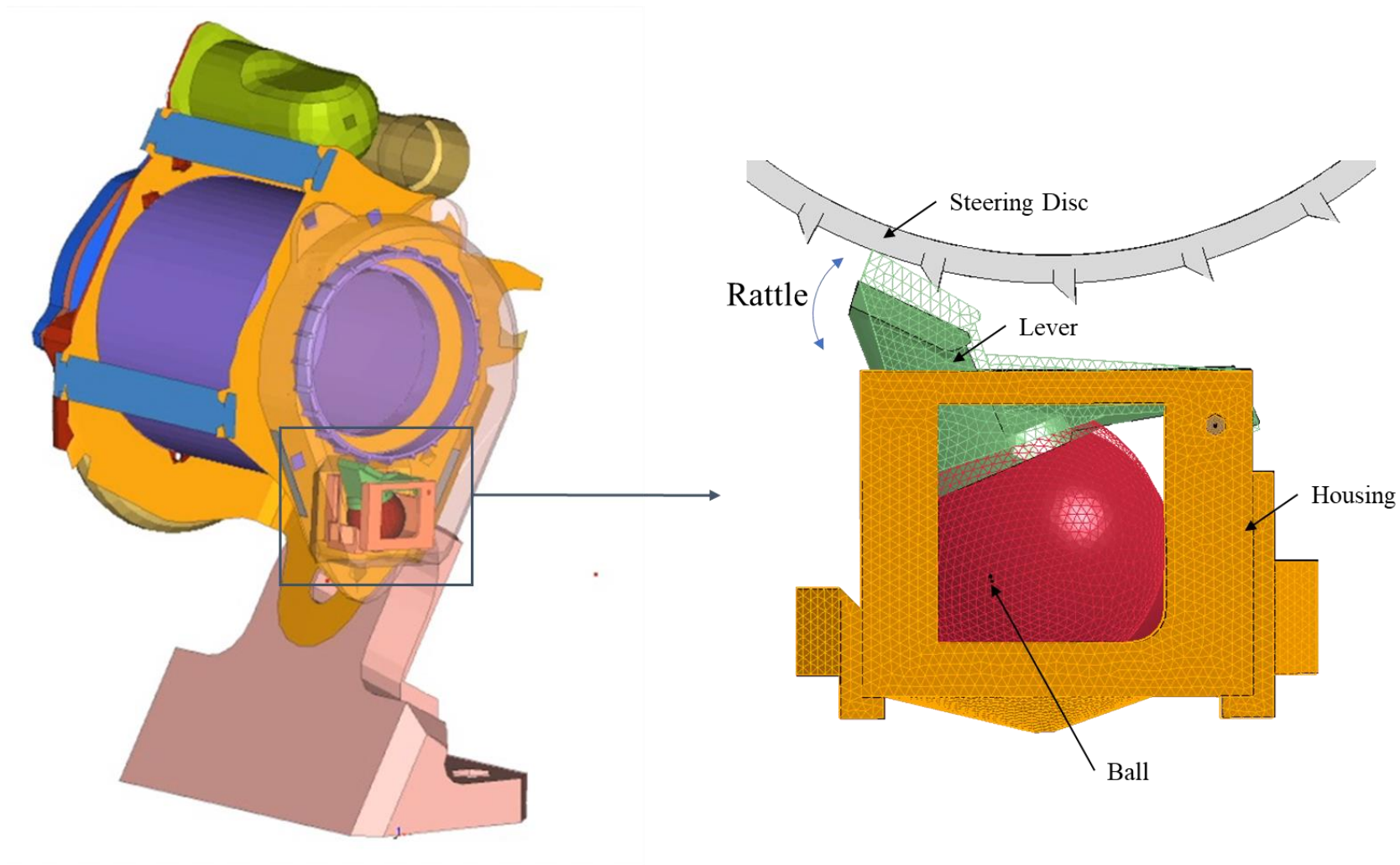
Time = 0.006
Contours of Resultant Displacement
min=0, at node# 10620
max=0.00315768, at node# 2367

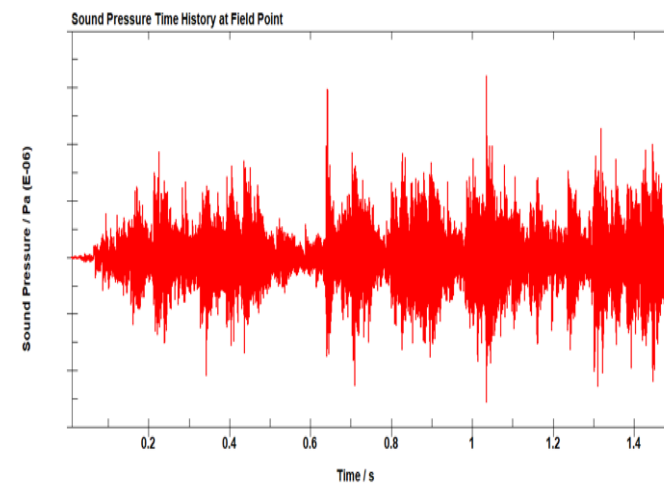
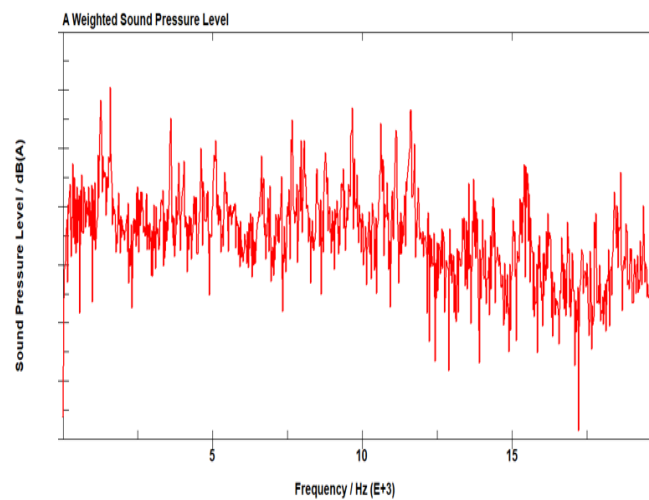
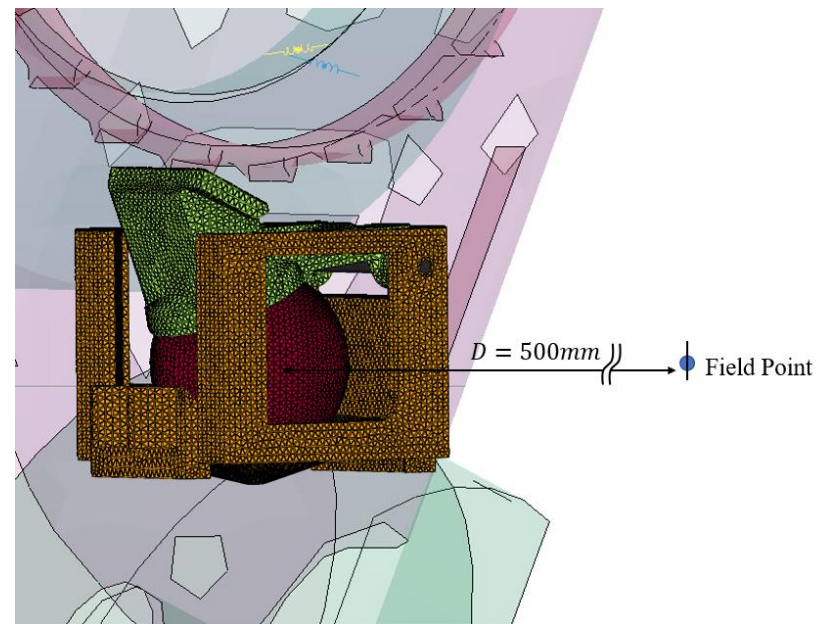
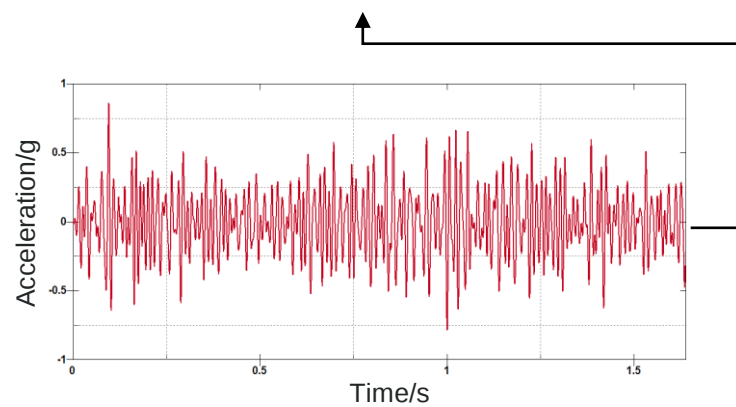
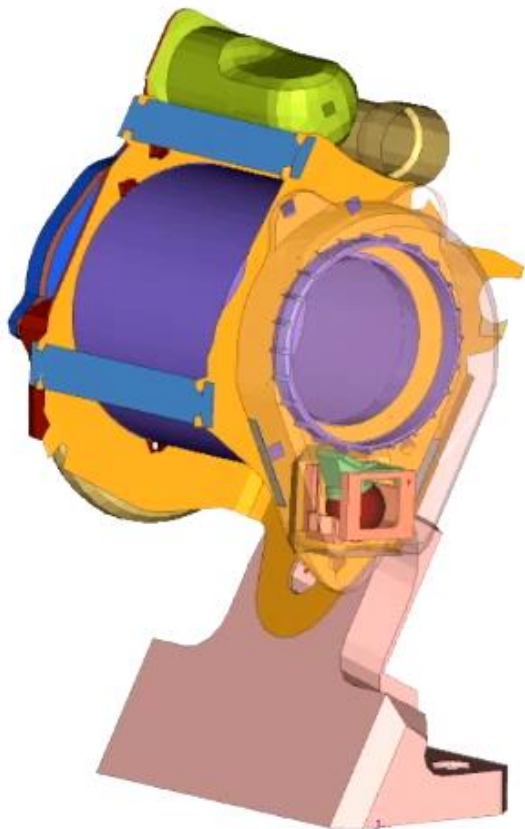


Resultant Displacement



仿真实例 3. 安全带卷收器车敏组件







Each year, Autoliv's
products save over
30,000 lives

[autoliv.com](https://www.autoliv.com)

Internal

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