

## LS-DYNA

LS-DYNA is a multi-purpose, explicit and implicit finite element program used to analyze the nonlinear dynamic response of structures. Its fully automated contact analysis capability, a wide range of constitutive models to simulate a whole range of engineering materials (steels, composites, foams, concrete, etc.), error-checking features and the high scalability have enabled users worldwide to solve successfully many complex problems. >Additionally LS-DYNA is extensively used to simulate impacts on structures from drop tests, underwater shock, explosions or high-velocity impacts. Explosive forming, process engineering, accident reconstruction, vehicle dynamics, thermal brake disc analysis or nuclear safety are further areas in the broad range of possible applications. In leading-edge research LS-DYNA is used to investigate the behaviour of materials like composites, ceramics, concrete, or wood. Moreover, it is used in biomechanics, human modelling, molecular structures, casting, forging, or virtual testing.

Anselm provides **1 commercial license of LS-DYNA without HPC** support now.

To run LS-DYNA in batch mode you can utilize/modify the default lsdyna.pbs script and execute it via the qsub command.

```
‘ #!/bin/bash #PBS -l nodes=1:ppn=16 #PBS -q qprod #PBS -N $USER-  
LSDYNA-Project #PBS -A XX-YY-ZZ
```

**! Mail to user when job terminate or abort**

**PBS -m ae**

**!change the working directory (default is home directory)**

**cd (working directory must exists)**

```
WORK_DIR="/scratch/$USER/work" cd $WORK_DIR
```

```
echo Running on host hostname echo Time is date echo Directory is pwd
```

```
module load lsdyna
```

```
/apps/engineering/lsdyna/lsdyna700s i=input.k ‘
```

Header of the pbs file (above) is common and description can be find on this site. SVS FEM recommends to utilize sources by keywords: nodes, ppn. These

keywords allows to address directly the number of nodes (computers) and cores (ppn) which will be utilized in the job. Also the rest of code assumes such structure of allocated resources.

Working directory has to be created before sending pbs job into the queue. Input file should be in working directory or full path to input file has to be specified. Input file has to be defined by common LS-DYNA .k\*\* file which is attached to the LS-DYNA solver via parameter i=