

LS-DYNA electromagnetism (EM)

Coupled mechanical, thermal, electromagnetic simulations

The LS-DYNA electromagnetism (EM) module allows performing coupled mechanical, thermal, electromagnetic simulations. It uses a Finite Element Method (FEM) for the solid conductors coupled with a Boundary Element Method (BEM) for the surrounding air hence avoiding the need to mesh the air and allowing simulations with moving and/or deformable conductors. The EM solver is automatically coupled with the mechanics and the thermal solvers, allowing for accurate and easy to set up multiphysics simulations. Consequently, the LS-DYNA EM solver has been widely adopted by the electromagnetic metal forming and welding community.

Application:

- Magnetic metal forming or welding
- Induced heating
- Resistive spot welding
- Sliding contact for rail gun applications
- Coupling with CFD solver for kettle applications
- Battery crush in electric car crash

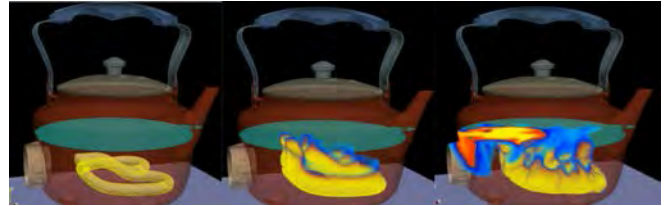
Feature:

- Easy connection with external circuits
- Computation of self and mutual inductances
- 3D and 2D axisymmetric versions
- Electromagnetic contact
- Available with solid, shells and thick shells
- Misc. EM equations of state
- Misc contact resistance models

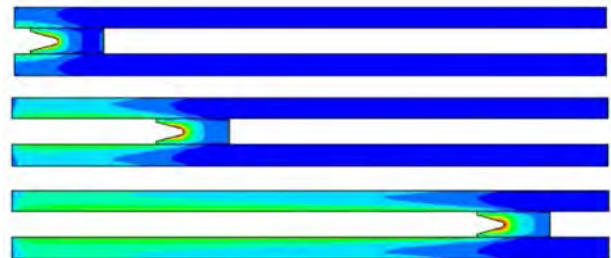
youtube channel:

www.youtube.com/channel/UCPuoss7k-louTDXGT2EFiw

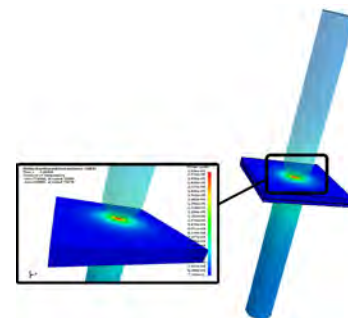
web site www.lstc.com/applications/em/



CFD solver is coupled to the solid thermal solver and the Electromagnetism solver to simulate the heating of water inside an electric kettle which is plugged in to standard 110V switch.



Railgun simulation features the EM sliding contact feature that allows two conducting parts to slide one against the other while some current is flowing through them.



Resistance spot welding simulation, where the Joule heating due to the material and contact resistances gives the temperature needed for the weld. Different contact resistance models exist in LS-DYNA.

Information - 30-day LS-DYNA demo license: sales@lstc.com



DYNA

MORE

www.dynamore.de