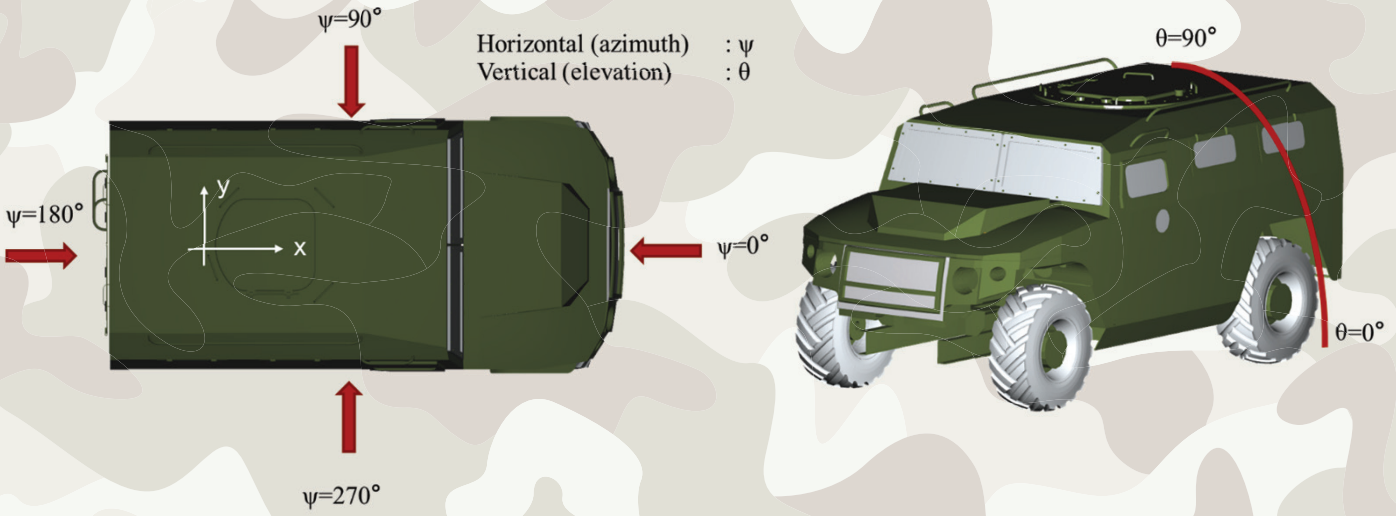
Certa Sim

Providing Innovative Solutions

The IMPETUS Afea Solver®

Vulnerability and Lethality Simulations

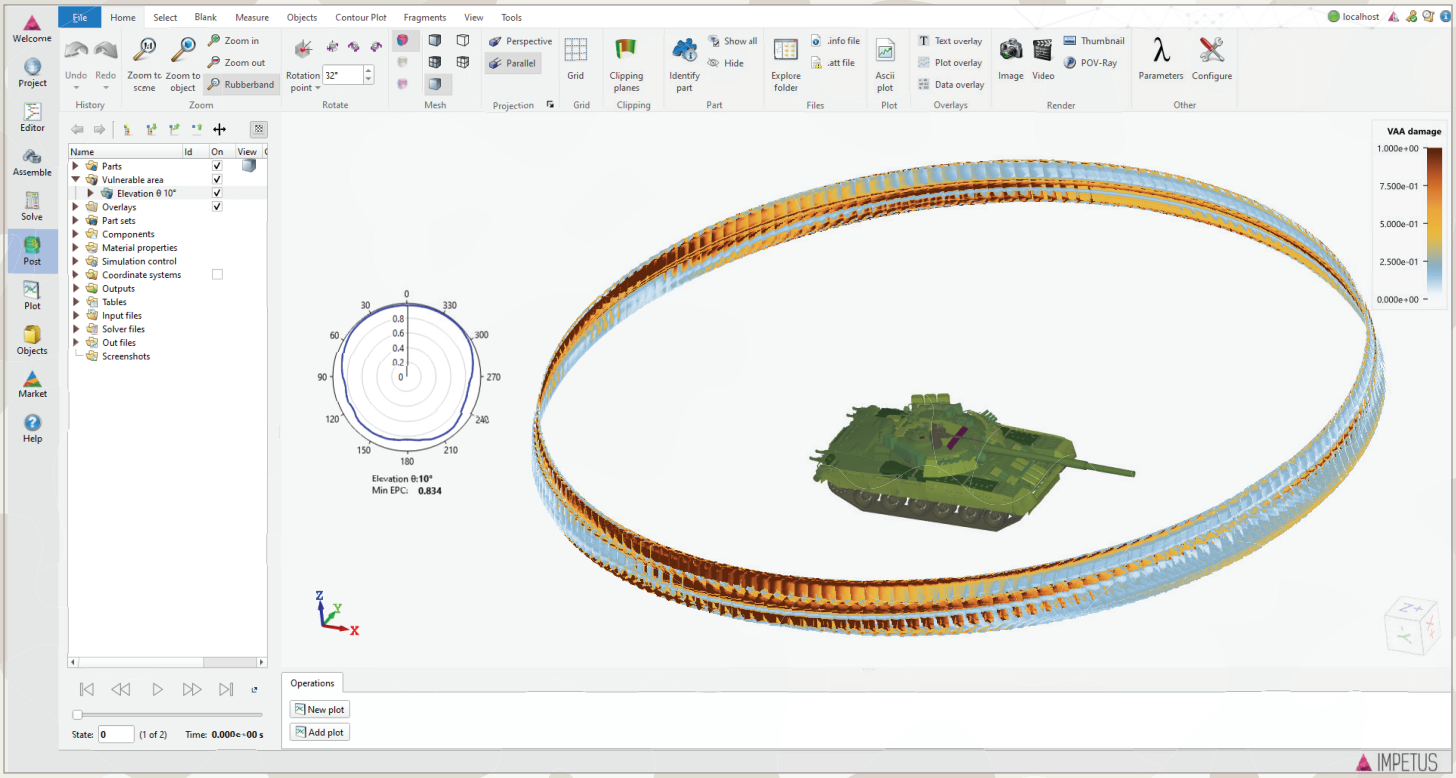
Armored vehicles requirements include Protection Level for KE and artillery threats. This is the case for a light armored vehicle as well, given that the threat levels are different. Terminal ballistic testing is very costly, and the vehicle structure redesign in case of failure adds significantly to development costs. Using a numerical tool to identify areas on a vehicle that are vulnerable will reduce the costs



during the design phase and help to better protect the warfighters. The approach is widely used in place of experiments. This type of simulation is referred to as “Vulnerability and Lethality” assessment (V/L), and the IMPETUS Solver includes a comprehensive and easy to use V/L tool. The parts in the model that are protected armor are specified as input.

For each of these, the material RHA equivalent per unit thickness is listed in tabular form, referred to as a Protection Table. These values can be seen as material parameters for the ballistic performance, and it is the ID of the constitutive model that is referenced. Both the armor and the protective volume are meshed with finite elements, which need to be fine enough to capture the geometry. Further, the protective volume must be specified. Shot angles are defined by horizontal (azimuth) and vertical (elevation) angles. They are specified as start and end locations, together with the number of frames representing a shot angle. For each frame, hit spots are used to define a ballistic threat. The threats follow a straight path through the armor and based on this; damage evaluation can be done. The results are presented as damage maps that visualize the vehicle’s ballistic performance and potential weaknesses.

The IMPETUS GUI has a tailored interface for vulnerability assessment as show below. Productivity is always the focus of our GUI development, and the V/L interface is no different. It is user-friendly and provides the visualization required to evaluate the results easily.



Key Features and Benefits:

- Use the same Finite Element Mesh developed for structural analysis to define the geometry.
- Simple set-up for millions of ballistic shot lines with very few lines of input.
- Computationally efficient, even for large models.
- Based on RHA equivalent with information from ballistic tests.
- Straightforward Post-Processing with our tailored GUI interface.

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IMPETUS driving precision

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