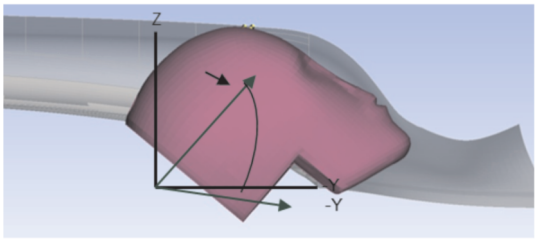
Volvo Car Corporation: ANSA and META for interior Head impact analysis

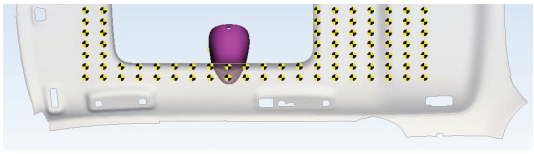
Challenge

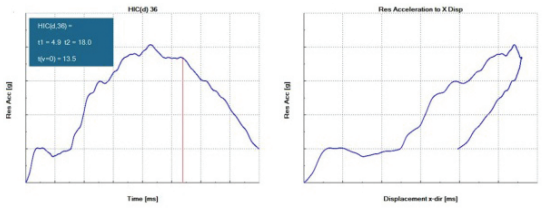
- The development of an automatic procedure that can speed up a Head Impact test for the Upper Roof area of a vehicle in accordance with FMVSS201U protocol.

Approach

- A script, which calculates possible Target Points on the Upper Roof area and produces Robustness Analysis for each Target, has been developed.
  A difficult task was the identification of the areas of the upper Roof where the maximum vertical angle can be achieved. For this reason, an advanced algorithm, which positions the Impactor with the desired vertical angle and simultaneously acquires the minimum contact distance, has been developed. The positioning is applied simultaneously to all the identified Target Points and the corresponding keyword files are created.
  The results are presented, according to the federal regulations and robustness studies, as overviews as well as for a single Target Point in META.







Results

- The innumerous Target Points which created uncertainty in the study of Upper Roof area are now identified in an automatic way. This, in combination with having the ability to position the Headform massively for all the Targets, in really difficult places of the Upper Roof, have reduced the time of an Interior Head Impact Analysis up to 100 times.

"FMVSS201U tool in ANSA and META were developed in close cooperation with OEMs in order to be efficient and easy to use. The algorithm in ANSA works in consistency with the regulations. The new functions with automatic targeting and multi positioning offer conservative strategies and enable robustness studies to detect worst-case scenarios. As well, the use of FMVSS201U tool in META speed up the analysis of the CAE results."

Dr Anneli Högberg, Crash Safety CAE analyst, Volvo Car Corporation