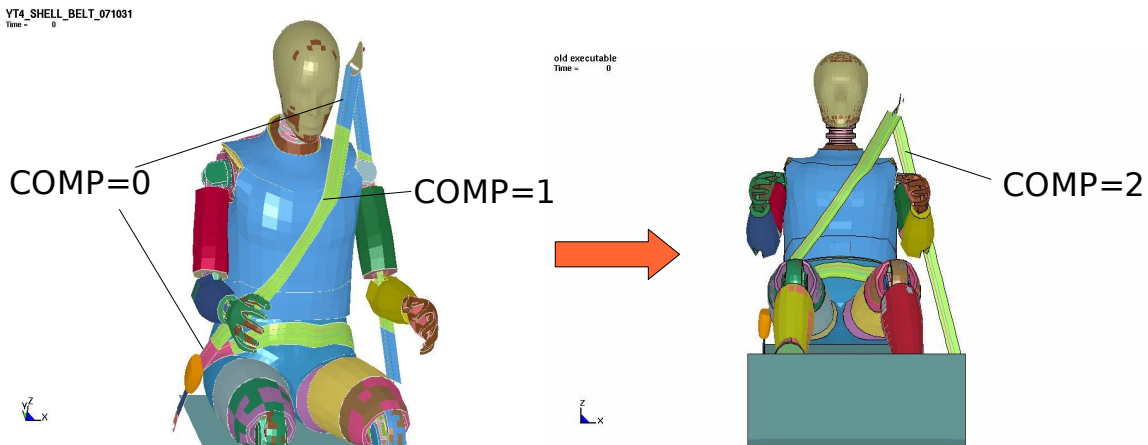


# LSDYNA 2D Seat Belt Update

Isheng Yeh  
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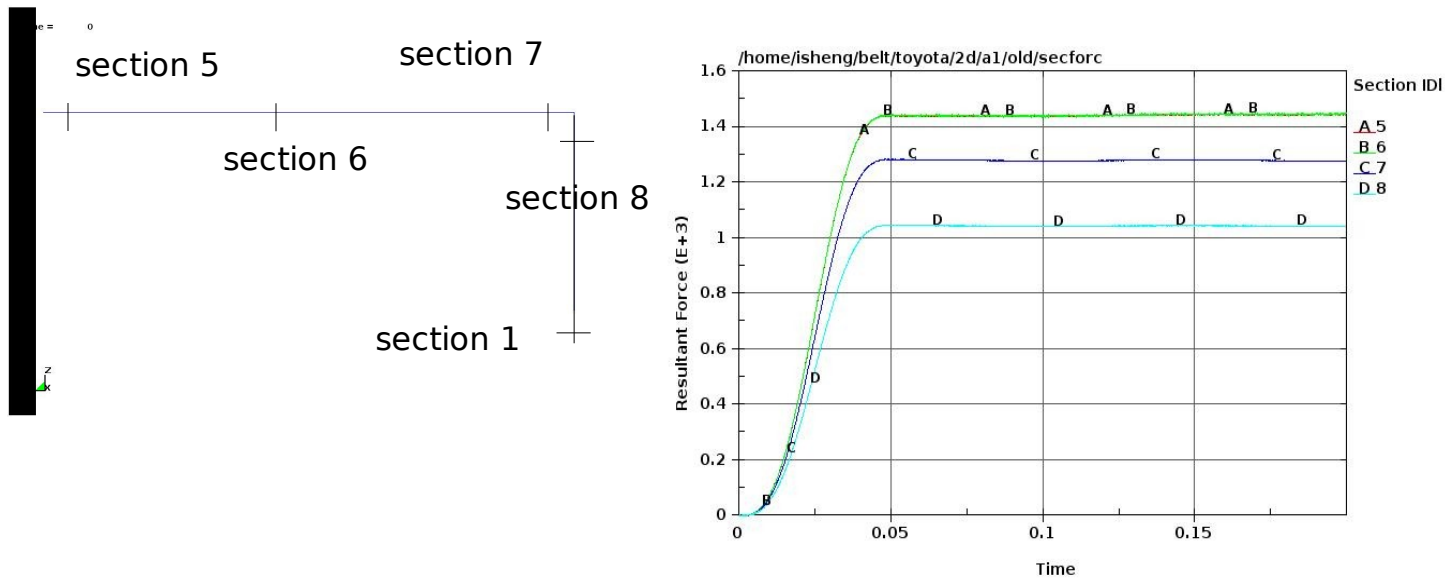
## Improvement

1. Setting COMP=2, the 6<sup>th</sup> column in \*MAT\_SEATBELT, trigger automatic compression elimination, and therefore allow user to use a single part to model the whole belt w/o worrying where to turn off compression, Fig. 1.

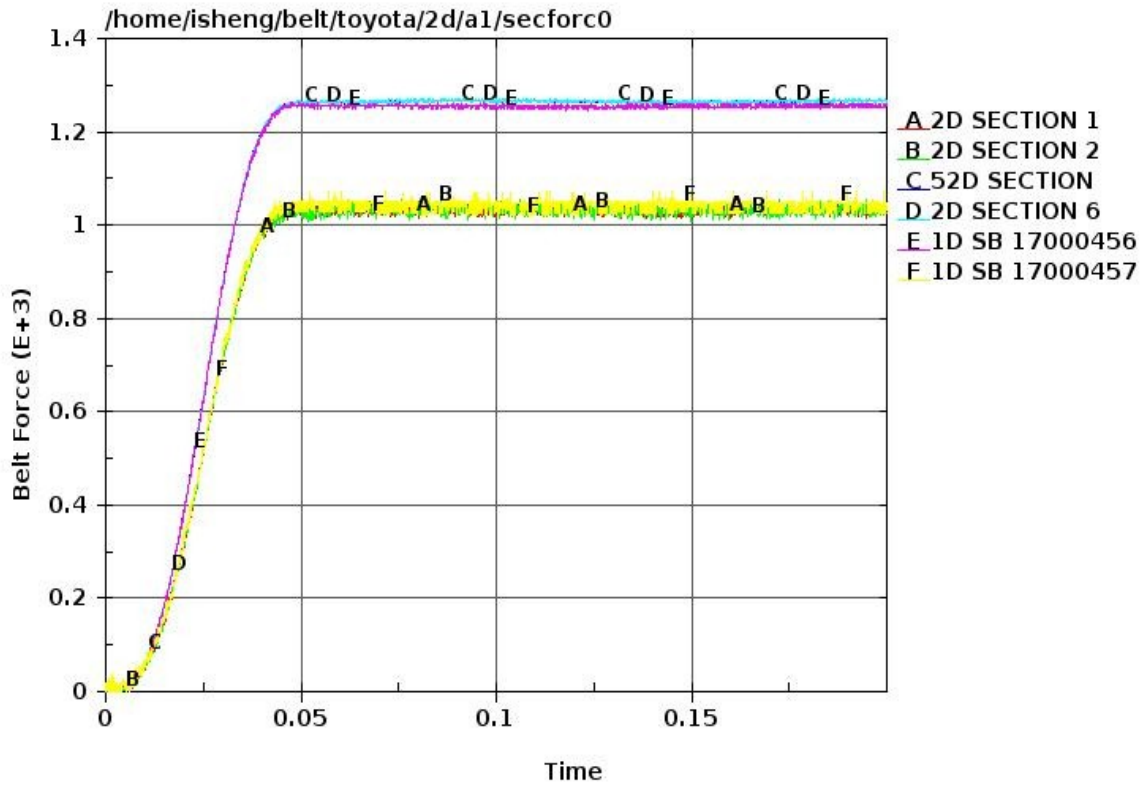


Old model uses COMP=0 and 1 for two parts      New model w. COMP=2

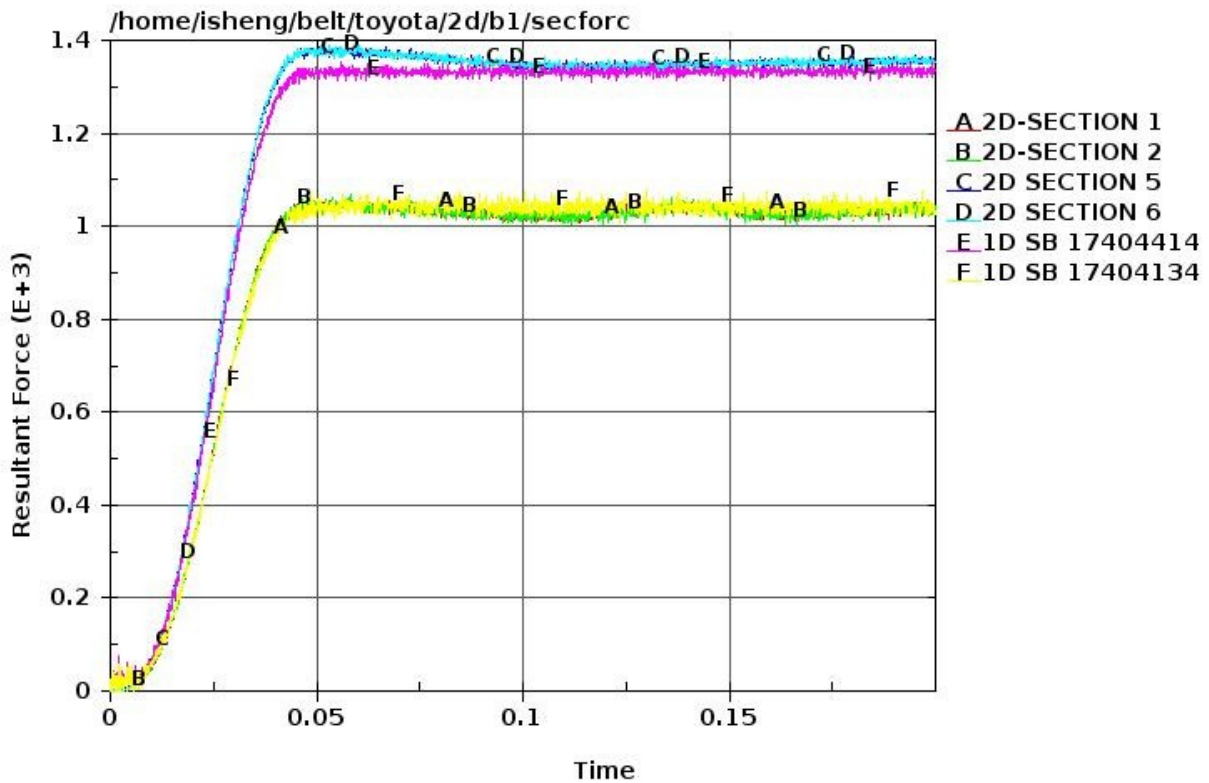
2. Setting COMP=2, the 6<sup>th</sup> column in \*MAT\_SEATBELT, also synchronizes the strains of 1d and 2d elements associated with 2d seat belt elements. This help get rid off the 2D belt force discontinuity observed by Makino.



Belt force discontinuity for 2d belt load (dd executable)

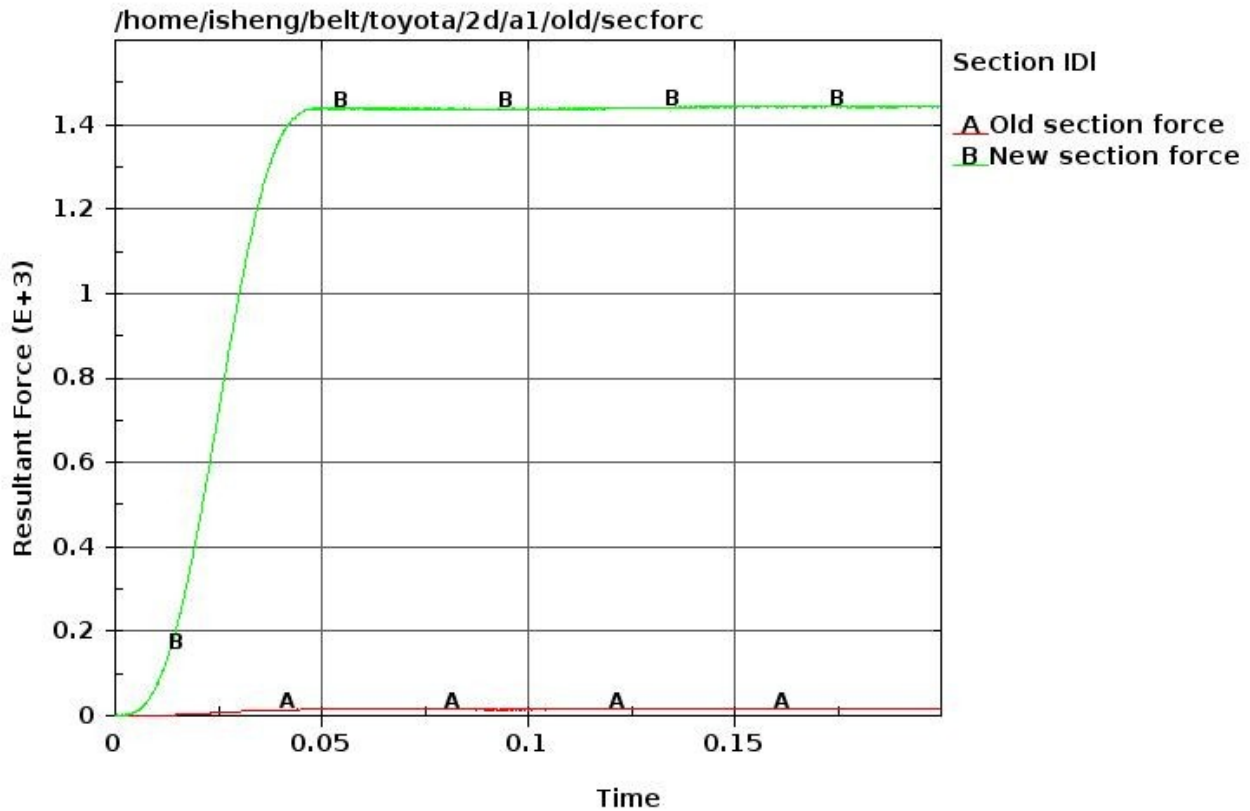


Correlation between 1D and 2D belt model, Markino A-1 (new executable)



Correlation between 1D and 2D belt model, Markino B-1(new executable)

- section force calculation takes into consideration the contribution from 1d bar elements created internally by ls-dyna so that section force can now be used to compare results from test or 1d seat belt simulation.



- all internally created parts for 1d bar element will be affected by commands like `*DEFORMABLE_TO_RIGID` and `*DEFORMABLE_TO_RIGID_AUTOMATIC`. In other word, 1D parts will become rigid or deformable whenever the corresponding 2D parts for belt become rigid or deformable.

- 2D belt elements initially sitting inside a retractor can be pulled out now

