



The Russian Federation
Nizhny Novgorod State Technical University named after R.Y. Alekseev
Transport Systems Institute

Passive Safety Estimation Methods In Design Process Of Light Commercial Vehicle Body Structures

Tumasov Anton - presenter

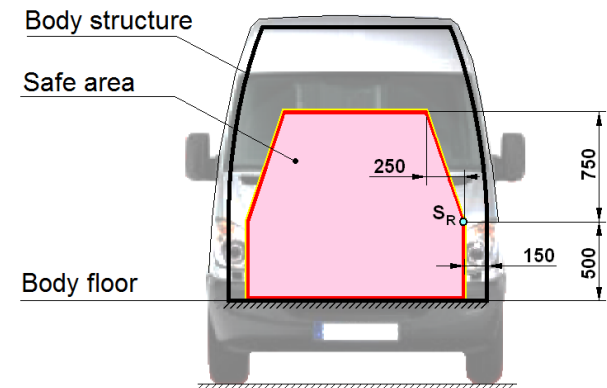
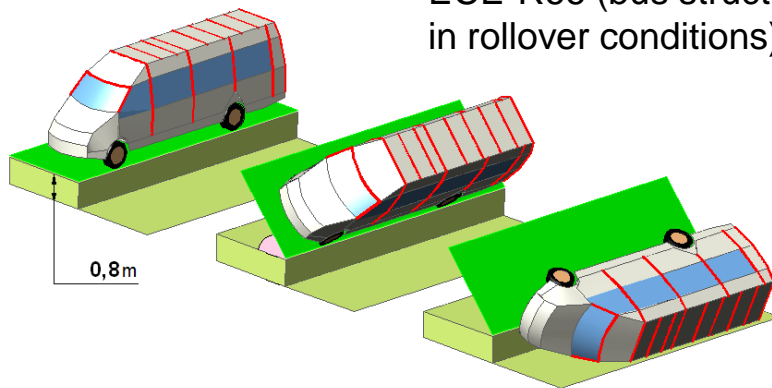
Petr Rogov, Lev Orlov, Andrey Vashurin

Mikhail Zelenov, Rinat Shabrov

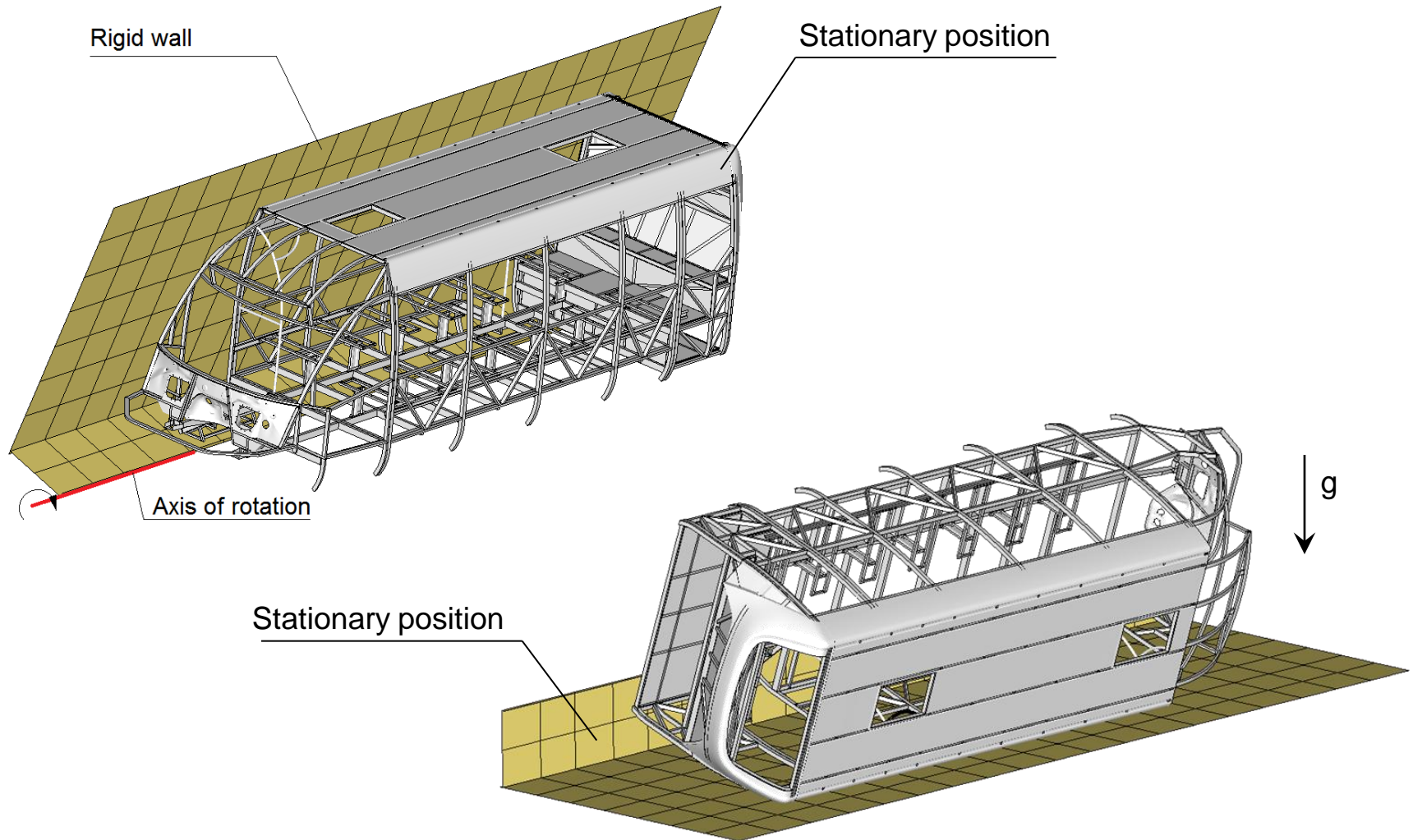


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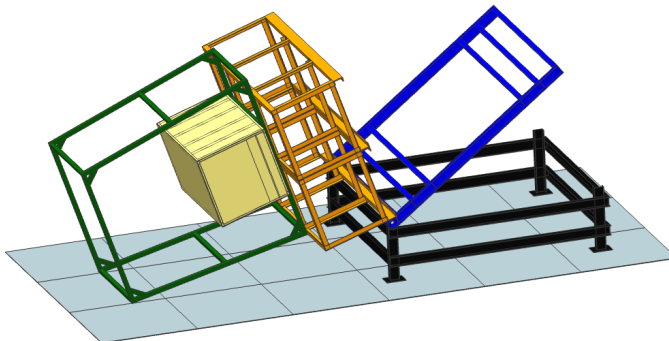
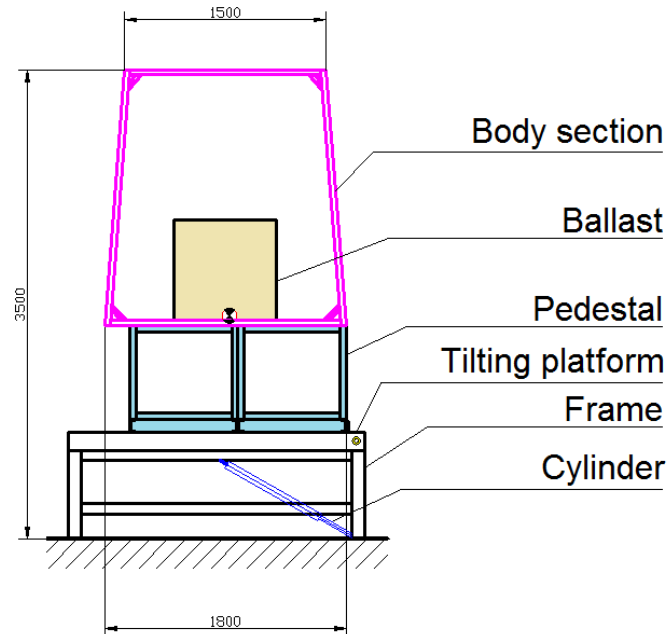
ECE-R66 (bus structure behavior in rollover conditions)



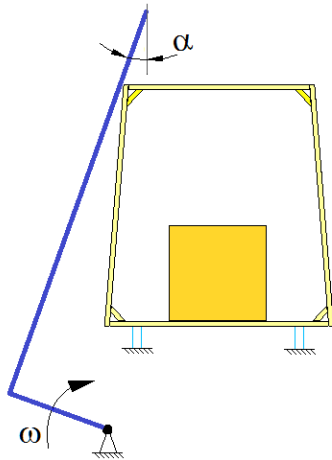
Structure passive safety estimation at the initial stage of design



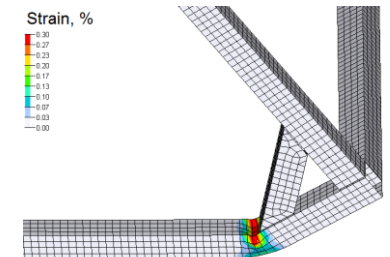
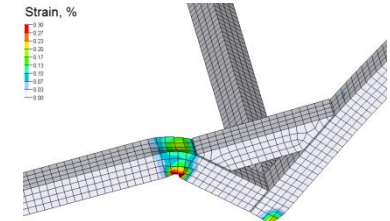
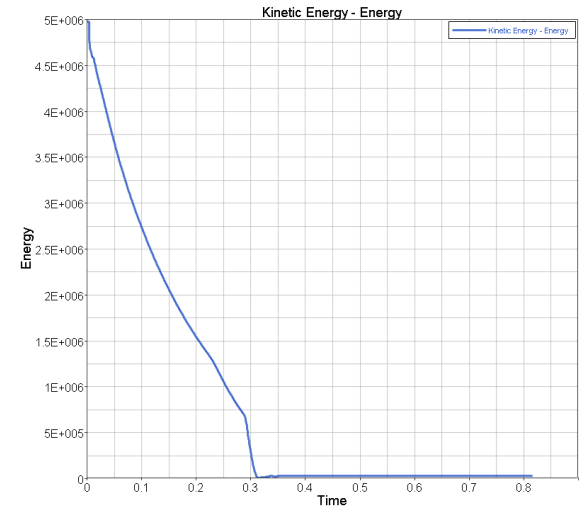
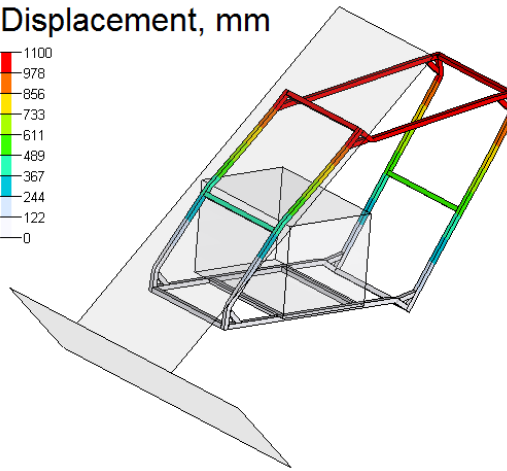
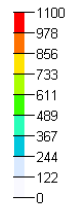
The experimental research of bus section rollover process



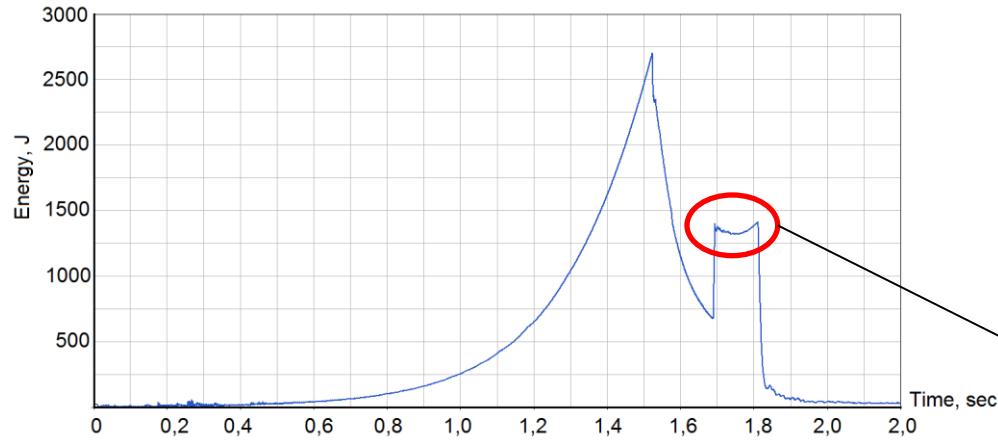
“Simple” simulation Stationary body and rotary rigid platform



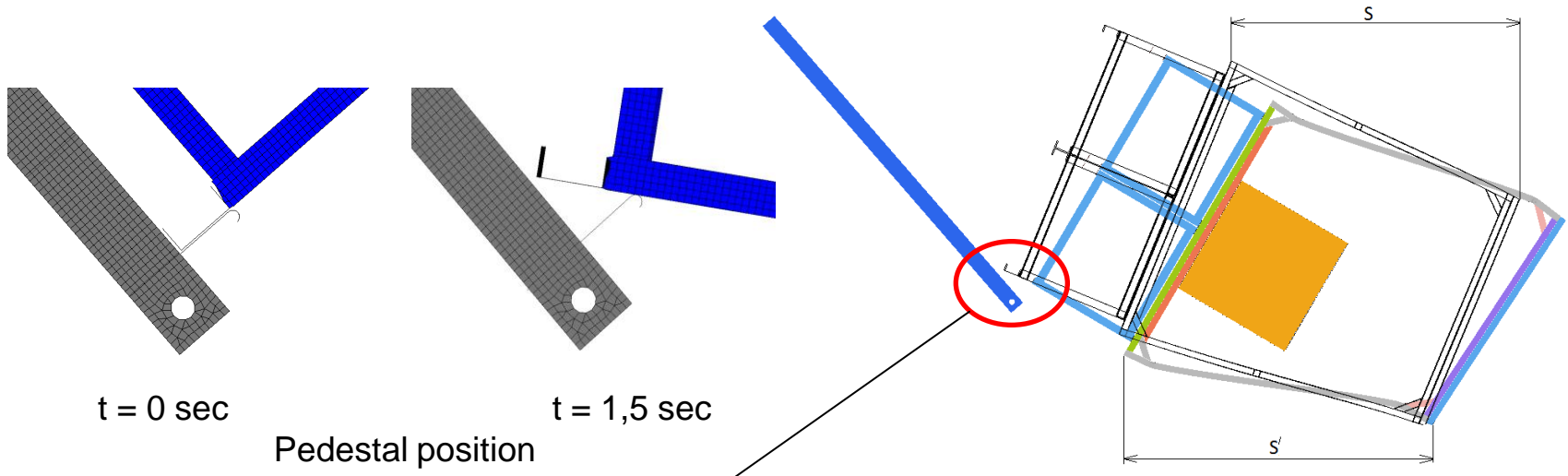
Displacement, mm



Simulation of rollover process (Rigid-to-Deformable Materials)

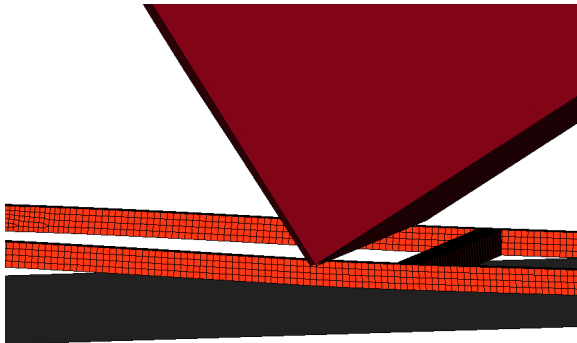
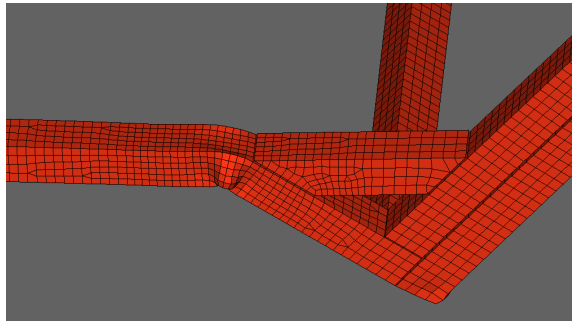
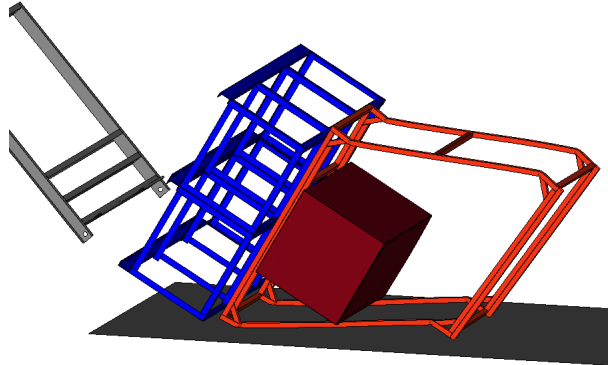


Kinetic energy distribution versus time



Comparison analysis

Simulation results and test data



1. The magnitude of the section (bus body) deformations depends on friction coefficient between the construction and rigid ditch surface, friction coefficient between the tilting platform shoulders and the lower parts of the body section.
2. Simulation of rollover process get more adequate result than “simple” simulation with stationary body structure and rotary rigid platform.
3. The bus rollover simulation with deformable material switching to rigid during free fall allows to get more accurate result than the simulation without material properties switching.
4. Relatively high accuracy of simulation results is achieved by reducing the amount of time steps, and accordingly the numerical error magnitude in the calculation.



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Thank you for attention!

603950, Russia, Nizhny Novgorod
NNSTU n.a. R.Y. Alekseev
Minin str., 24
www.en.ntnu.ru www.its.ntnu.ru

Transport Systems Institute
Anton Tumasov – vice-director for development
+7-905-19-20-576
anton.tumasov@ntnu.nnov.ru