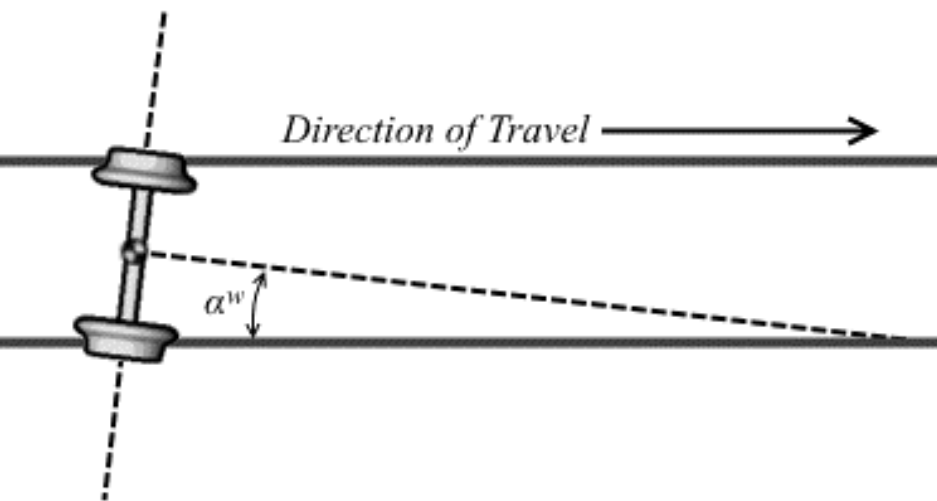


LARGE ANGLE OF ATTACK WHEEL CLIMB & NURAIL COLLABORATION

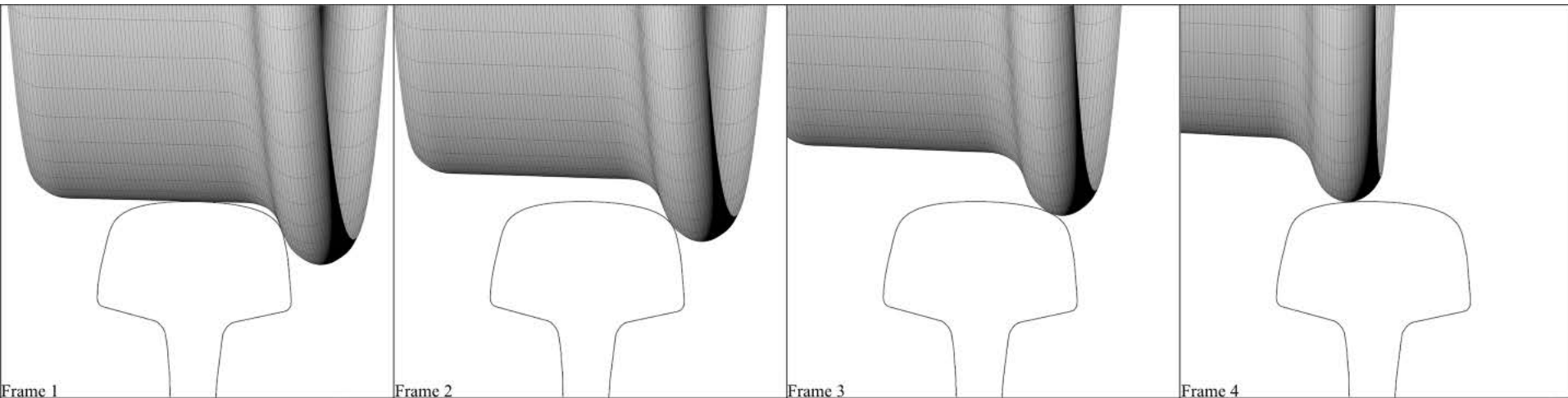
Presenter: James J. O'Shea, University of Illinois at Chicago (UIC)

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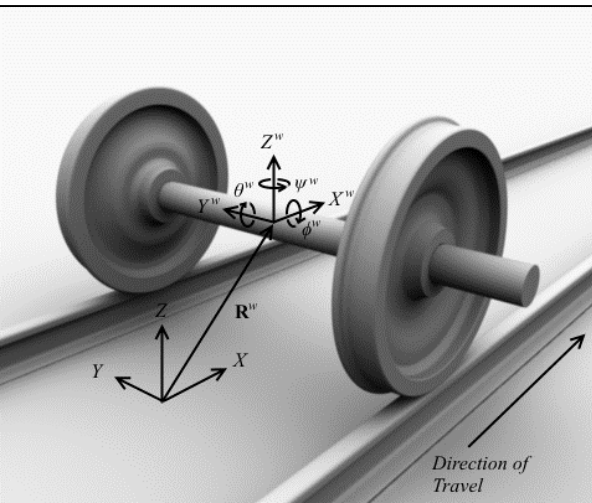
Large Angle of Attack Wheel Climb



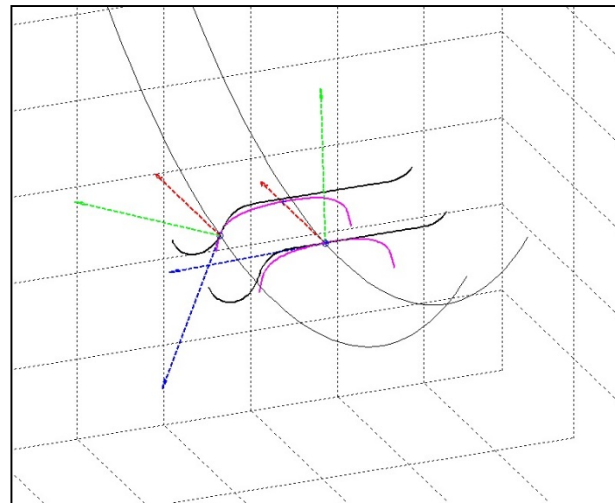
- What is a wheelset angle of attack?
- Why does it cause derailment potential?
- Is this a problem worth investigation?
- Why is this still a problem?



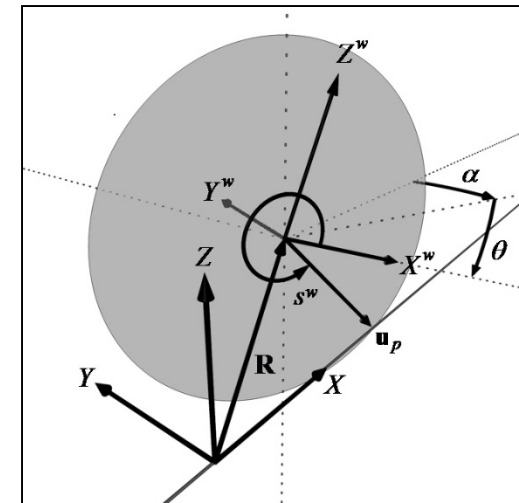
Large Angle of Attack Wheel Climb



Multibody System



Simplified Semi-Analytic Model

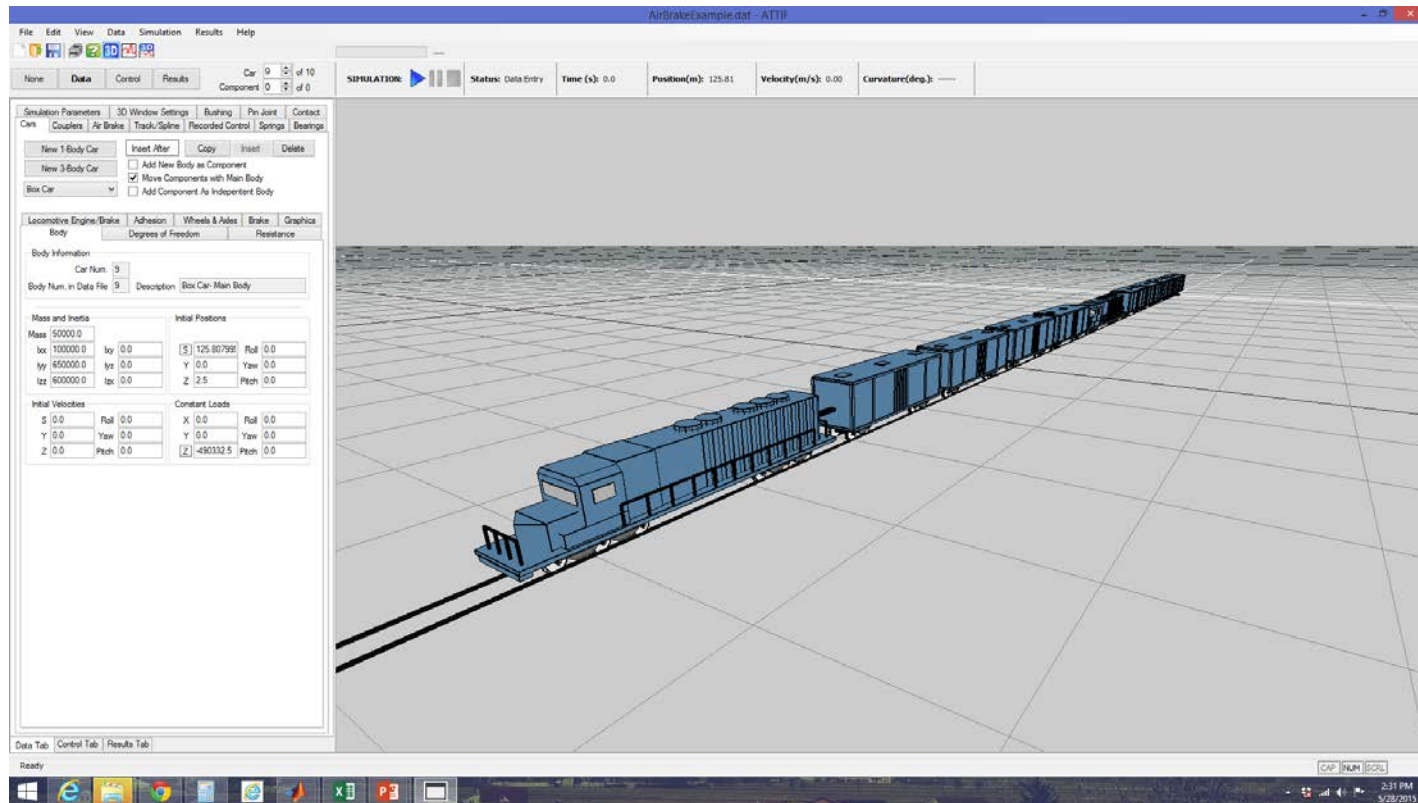


Kinetic & Kinematic Analysis

- Major Findings

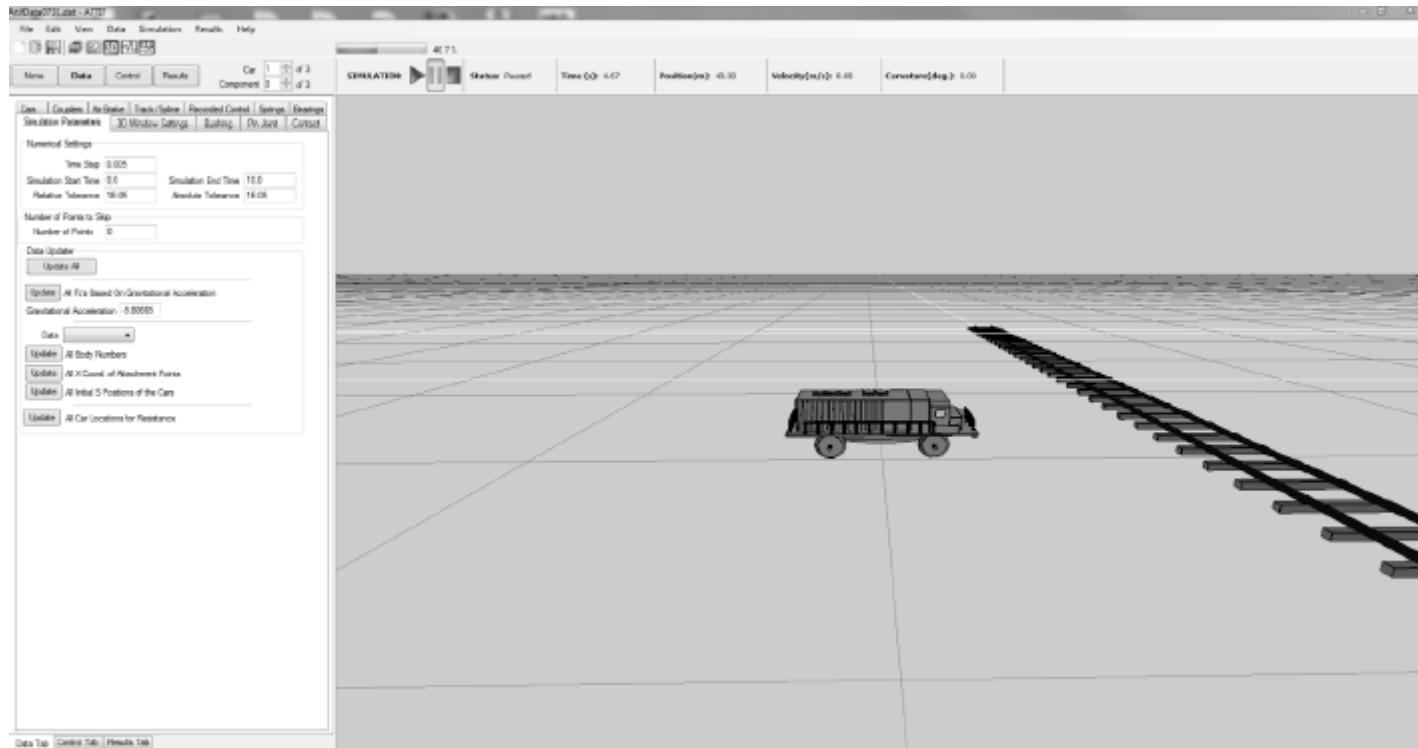
- Large angle of attack wheel climb is a significantly kinematic process
- Under sufficient force, wheel climb can occur without friction
- Derailment can occur without prediction by “conservative” criteria
- The derailment initiation configuration can be determined for a given angle of attack

Collaboration: Analysis of Train/Track Interaction Forces (ATTIF)



- ATTIF is a free-to-use, specialized code used to model and simulate the dynamics of long trains – developed at UIC
- ATTIF makes use of a specialized non-linear formulation that allows for the fast simulation of large and detailed models

Collaboration: Analysis of Train/Track Interaction Forces (ATTIF)



- Modification by UIC to facilitate UK's use for investigation and publication
- Choosing a NURail partner university gave UK the benefit of free software as well as in-depth assistance and support that would not likely be available from other sources

THANK YOU!

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