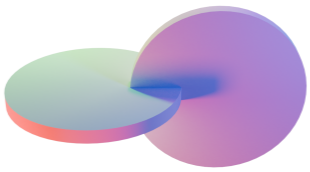

GIREP-EPEC
Transforming physics learning via Research & Practice
LEIDEN, 2025

Contribution ID: **43** Type: **Oral presentation**

Exploring secondary school students' operationalisation of relativistic thought experiments

Monday 30 June 2025 13:30 (20 minutes)

Special relativity is a challenging topic for secondary school students due to its abstract and counterintuitive nature. Thought experiments are often used to make relativistic effects tangible. Prior research has shown that students often express thought experiments in intuitive operationalisations, rooted in everyday experiences. We developed and evaluated a three-part lesson series focusing on simulation-based inquiry activities to familiarise students with the formalism of spacetime events. We found that the simulation activities helped students to operationalize displacement, relative velocity, and proper time more formally. Moreover, the insights gained from the simulation activities were successfully transferred to post-lesson questions.

Education level

Age 15-18 (Secondary education)

Physics topic

Contemporary and modern physics

Research focus

Student conceptions / Preconceptions / Misconceptions

Research method

Educational design research (Qualitative research)

Organizing preference criteria

Track

Author: ALSTEIN, Paul (Utrecht University)

Presenter: ALSTEIN, Paul (Utrecht University)

Session Classification: Parallel oral presentations

Track Classification: Contemporary and modern physics (CONT)