Effects of prolonged automated driving on take-over performance

**MOTIVATION**
- Longer automated drives could lead to an increase in drowsiness and fatigue.
- What effects can be seen resulting from longer automation on driver state and how do they affect the take-over performance in different scenarios compared to a manual baseline?

**METHOD**
- Driving simulator (static) study
  - n = 57, mean = 33 years (SD = 13y)
- Experimental design
  - Between subject factors: group (level of automation and traffic density)
  - Within subject factors: duration of automated driving (2x5 min vs. 30 min)
- Within subject factor: situation

**RESULTS**
- Driver state: longer automated driving has a significant influence on
  - Eyes on Road Rate (EOR)
  - Pupil diameter
  - Center of Pressure (COP) (activity of the driver)

- Significant differences between the take-over situations concerning
  - Minimum longitudinal acceleration
  - Maximum lateral acceleration
  - Take-over time

**SUMMARY**
- Prolonged automated driving (30 min) significantly influences the driver state,
  - but does not affect take-over performance.