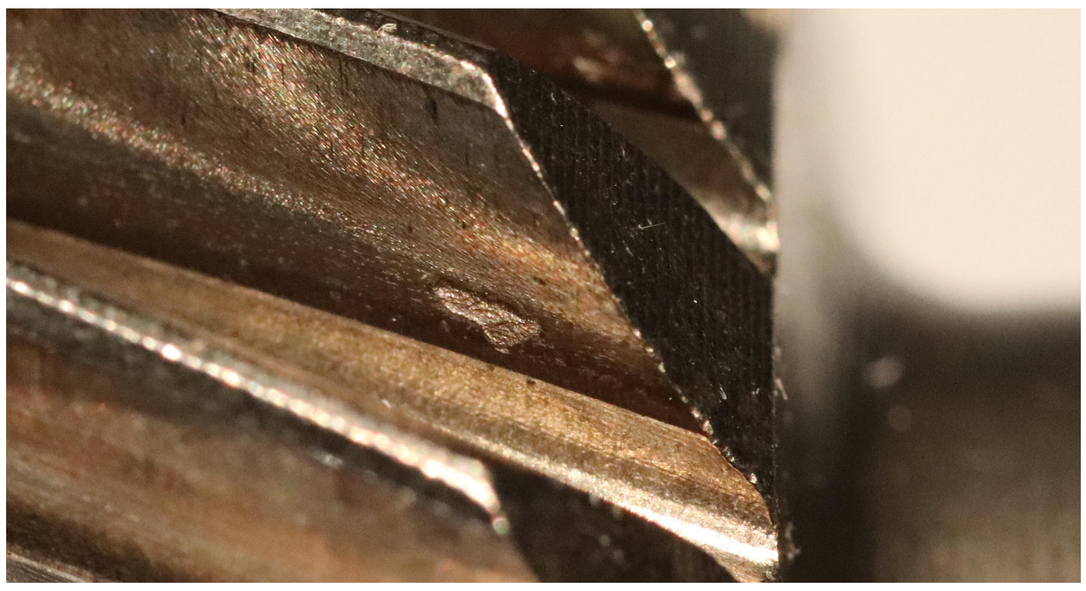
UNI STUTTGART

Drive Technology Department

Increasing the Remaining Useful Life of Gears through an Adaptive Operating Strategy

Motivation

In case-hardened gears, pitting damage occurs first on the weakest tooth. The other teeth are intact or slightly pre-damaged until failure (4% pitting area).

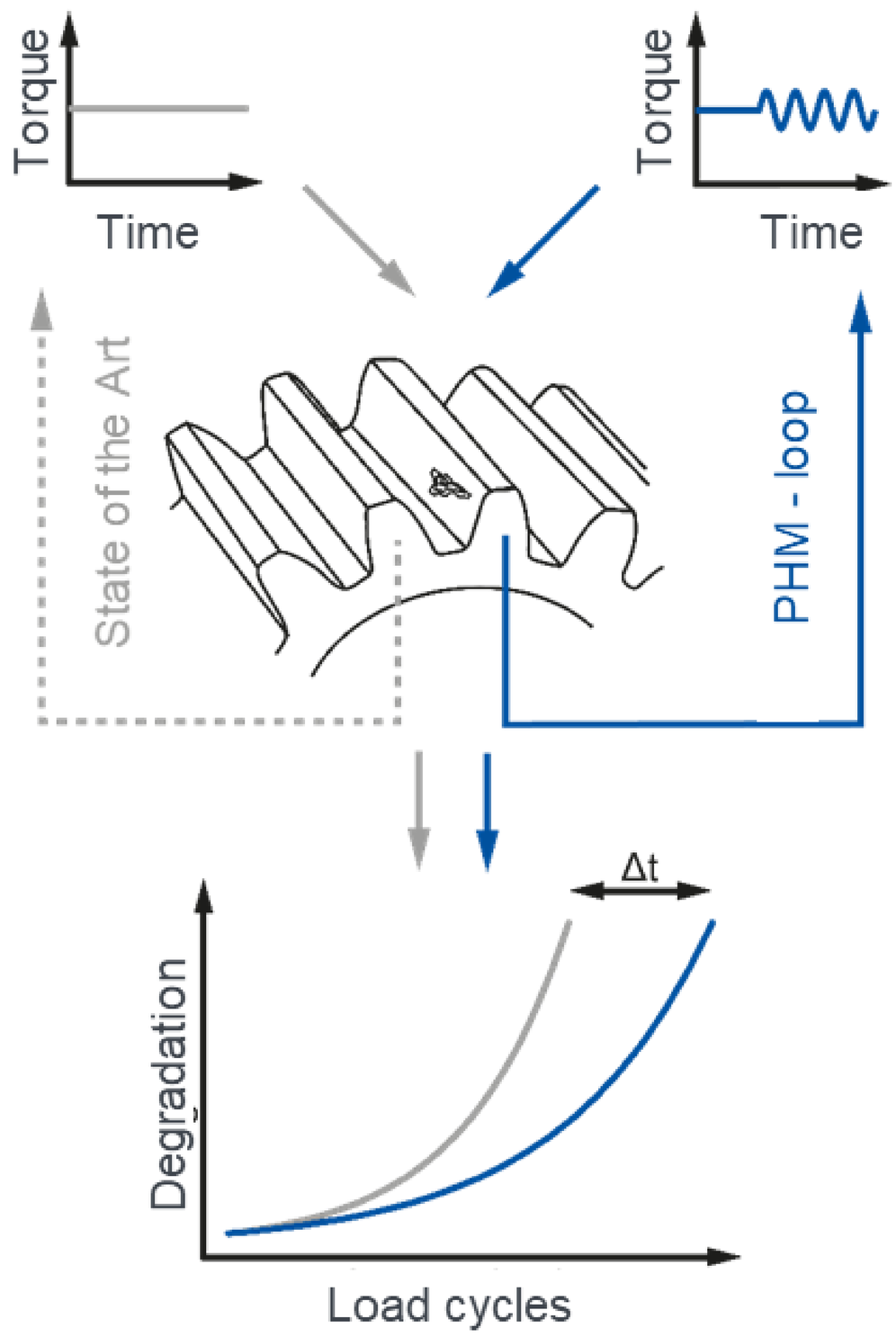


Objective:

- Increasing the lifetime of gears
- Alternative: reduced tooth width or larger manufacturing tolerances with the same lifetime
- Uniform distribution of pitting damage across all teeth (Prognostics and Health Management (PHM) application)
- Consistent average power of the gearbox

Approach:

- Operating strategy for local load reduction at the tooth
- Application of an adapted periodic drive torque
- Shifting the minimum torque to the area of the weakened tooth (large lifetime effects due to high Wöhler exponents)



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