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Exploring Elasto-Hydrodynamic Lubrication Using a Finite Volume CFD Based Method

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This paper uses a finite volume approach implemented using the OpenFOAM package to study elasto-hydrodynamic lubrication (EHL). The adopted methodology provides multiple benefits over standard Reynolds equation approaches including improved fluid-solid interaction (FSI) modelling, phase change, full thermal effects, resolving continuum gradients in all directions and influence of inlet conditions owing to a larger domain of study. Results are presented to firstly, provide a comparison of model predictions with experimental measurements and Reynolds based solutions, and subsequently, to explore significant effects in EHL lubrication such as influence of side-roll ratio, inlet and in-contact temperatures, EHL traction and film thickness profile.