

## Elastohydrodynamic Lubrication Study Using Discontinuous Finite Volume Method

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**Abstract :** Problems in elastohydrodynamic lubrication have attracted a lot of attention in the last few decades. Solving a two-dimensional problem has always been a big challenge. In this paper, a new discontinuous finite volume method (DVM) for two-dimensional point contact Elastohydrodynamic Lubrication (EHL) problem has been developed and analyzed. A complete algorithm has been presented for solving such a problem. The method presented is robust and easily parallelized in MPI architecture. GMRES technique is implemented to solve the matrix obtained after the formulation. A new approach is followed in which discontinuous piecewise polynomials are used for the trial functions. It is natural to assume that the advantages of using discontinuous functions in finite element methods should also apply to finite volume methods. The nature of the discontinuity of the trial function is such that the elements in the corresponding dual partition have the smallest support as compared with the Classical finite volume methods. Film thickness calculation is done using singular quadrature approach. Results obtained have been presented graphically and discussed. This method is well suited for solving EHL point contact problem and can probably be used as commercial software.

**Keywords :** elastohydrodynamic, lubrication, discontinuous finite volume method, GMRES technique

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