

Shape optimization of an elastomer rolling structure taking into account contact and friction

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Abstract :

In this presentation, a computational strategy for shape optimization for a rolling elastomer structure of the airless tire type will be discussed. The various ingredients of the numerical strategy will be presented (shape gradient, fictitious domain strategy, level-set update, etc.). Among these ingredients, taking frictional contact conditions into account poses notorious difficulties in this context. The advantages of Nitsche's method will be presented, together with an analysis of the convergence of the shape gradient and the difficulties it can pose. Various numerical examples will illustrate the choices made.