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A NUMERICAL APPROACH TO THE DYNAMIC SOIL - PIPELINE INTERACTION UNDER DEGRADATING ENVIRONMENTAL EFFECTS

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ABSTRACT

A numerical approach is presented for the unilateral contact problem of the seismic soil-pipeline interaction under degradation environmental effects. The problem is considered as an inequality one of structural geotechnical engineering [1,2]. So, the nonconvex unilateral contact conditions due to tensionless and elastoplastic softening-fracturing behaviour of the soil as well as due to gapping are taken into account. The numerical approach is based on a double discretization, in space by FEM and /or BEM and in time, and on mathematical programming. The number of the problem unknowns is significantly reduced to unilateral ones only and a nonconvex linear complementarity problem is solved in each time-step.

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