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SPACE ADAPTIVE FINITE ELEMENT METHODS FOR DYNAMIC OBSTACLE PROBLEMS*

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Abstract. The necessity to approximate dynamic contact problems arises in many engineering processes. Because of the local effects in the contact zone, adaptive techniques are suited to improve the finite element discretisation of such problems. In this article, the Newmark method in time and finite elements in space are used to approximate the solution numerically. A spatial error estimator is derived from the semidiscretised problem. The approach relies on an auxiliary problem, which is a variational equation. An adaptive refinement process is based on this error control. Numerical results illustrate the performance of the presented method.

Key words. dynamic obstacle problem, a posteriori errror estimation, mesh refinement, finite element method

AMS subject classifications. 35L85, 65M50, 65M60

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