Flux-reconstruction for obstacle problem and a posteriori error estimation

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In this talk we consider the elliptic obstacle problem for a membrane. We solve this problem with P2 nonconforming finite elements the so-called Fortin-Soulie elements, see [1]. In [2] Fortin-Soulie elements were used successfully to reconstruct a H(div)-conforming flux with application to a-posteriori error estimation. We reconstruct a flux for the obstacle problem using these P2 noncorming finite element and use this flux for a a- posteriori error estimation based on the dual formulation of the obstacle problem. The basic idea of the estimation can be traced back to Prager and Synge [3]. Finally numerical results will be presented.

References:

[1] M. Fortin, M. Soulie, A nonconforming piecewise quadratic finite element on triangles, Internat. J. Numer. Methods Engrg. 19 (1983) 505–520.

[2] Kwang-Yeon, Kim,Flux reconstruction for the P2 nonconforming finite element method with application to a posteriori error estimation, Applied Numerical Mathematics 62, 1701-1717, 2012.

[3] Prager W., Synge J.L., Approximations in elasticity based on the concept of function space, Quart. Appl. Math. 5 (1947) 241–269.

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