# RECOVERY OF THE FRICTIONLESS CONTACT STRESS FIELD IN THE CARTESIAN GRID FINITE ELEMENT METHOD (cgFEM)

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This paper presents an enhancement of the SPR-C technique[1] (Superconvergent Patch Recovery[2] with constrains) for the evaluation of a recovered stress field around the contact area of mechanical components considering the case of frictionless contact within the Cartesian grid framework (cgFEM [3]) where the FE mesh does not fit the geometry. In [1], we presented Lagrange multipliers-based procedure, to obtain polynomials, used to describe the locally recovered stress field, that satisfy the equilibrium and compatibility equations. In this work, we have extended this technique in order to improve the stress field around the contact area. The idea behind of the proposed technique is that of simultaneously evaluating two stress fields (one for each of the patches of the contacting bodies), enforcing the contact equilibrium equations by imposing the continuity of the normal stress field along the contact surface, together with the satisfaction of the internal equilibrium and compatibility equations. The numerical results show that the behaviour of the contact algorithm and its accuracy are considerably improved because of the improved accuracy obtained in the evaluation of the stress field around the contact surface.

## REFERENCES

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