

# SQP-methods for incremental plasticity

Christian Wieners<sup>1</sup>

The standard procedure in computational plasticity reformulates the incremental step into a minimization problem or an equivalent nonlinear variational problem, where the nonlinearity results from the projection onto the set of admissible stresses. Numerically, the incremental problem is solved by a semi-smooth Newton method, where the consistent tangent is chosen from the multi-valued derivative of the projection.

This standard procedure is compared with an realization of the SQP method, where the Newton method is replaced by a sequence of quadratic minimization problems with linearized constraints (which are solved approximately by a small number of semi-smooth Newton steps). We show that this optimization approach is more robust and more efficient in difficult cases, e. g., near to the limit load in perfect plasticity.

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<sup>1</sup>Universität Karlsruhe, Fakultät für Mathematik, Englerstr. 2, 76128 Karlsruhe, Germany,  
wieners@math.uni-karlsruhe.de