Computational inelasticity at different scales – FE technology and beyond

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ABSTRACT

The necessity to provide physically reasonable and mathematically sound descriptions of mechanical behaviour at different scales is without discussion. Nevertheless, for engineering design quick estimations of important quantities such as stresses and strain are needed. This is not even enough. At a larger scale, information about the overall behaviour of complex systems has to be supplied.

For this reason, we need to develop computational methods which on the one hand enable a detailed material description, on the other hand allow the bridging to coarser scales without losing too much information. In the present contribution, methods such as the phase field method are combined with FE technology, and, FE technology is combined with model reduction in order to reach this goal.