

# Finite Element Computational Homogenization of Multiscale Elliptic Problems

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**Keywords:** *finite element method, a priori error estimate, convergence, multiscale method*

## ABSTRACT

This talk presents a new approach for computational homogenization of elliptic problems with rough coefficients without any assumptions on scales. The new (variational) multiscale method is based on a local generalized finite element basis which consists of classical nodal basis functions and corresponding enrichment functions. The enrichment functions are solutions of the variational problem with the additional constraint that some quasi-interpolation of trial and test functions vanishes. This constraint ensures some surprising exponential decay of the enrichment functions and justifies their approximation on local vertex patches. The method represents unresolved scales in such a way that linear convergence with respect to the mesh size is preserved on arbitrary coarse meshes without any pre-asymptotic effects.

## REFERENCES

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