

# Uniform asymptotic formulae for Green's tensors in elastic singularly perturbed domains with multiple voids

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We present uniform asymptotic approximations of Green's kernels for boundary value problems of elasticity in singularly perturbed domains containing small holes. We consider the case of an isotropic Lamé operator with the Dirichlet boundary conditions for two and three dimensions, in addition we shall also study the situation of anti-plane shear. The main feature of the asymptotic approximations mentioned is their uniformity with respect to the independent spatial variables. We also offer examples, where results of asymptotic approximations are compared with independent accurate numerical simulations, and demonstrate the superior features of the asymptotic method.

The motivation for the talk, came from the asymptotic formulae derived for the Laplacian, in [1], [2].

## References

- [1] Maz'ya, V. G., Movchan A. B.: Uniform asymptotic formulae for Green's functions in singularly perturbed domains, *Journal of Computational and Applied Mathematics* (2006), doi.10.1016/j.cam.2006.10.038.
- [2] Maz'ya, V. G., Movchan A. B.: Uniform asymptotic formulae for Green's kernels in regularly and singularly perturbed domains, *C. R. Acad. Sci. Paris. Ser. I* **343**, 185–190, (2006).