

# A HIGHER ORDER PERTURBATION APPROACH FOR ELECTROMAGNETIC SCATTERING PROBLEMS ON RANDOM DOMAINS

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ABSTRACT. We are interested in time-harmonic electromagnetic scattering problems on scatterers with uncertain shape. Thus, the scattered field will also be uncertain. Based on the knowledge of the two-point correlation of the domain boundary variations around a reference domain, we derive a perturbation analysis of the mean of the scattered field. The approach is based on the second shape derivative of the scattering problem and will be at least third order accurate in the perturbation amplitude of the domain variations. To compute the required second order correction term, a tensor product equation on the domain boundary has to be solved. We discuss its discretization and efficient solution using boundary integral equations. Numerical experiments in three dimensions will be presented.

## REFERENCES

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