

27th IFIP TC7 Conference 2015 on System Modelling and Optimization

Recent trends in shape and topology optimization

## Shape optimization in electromagnetic applications

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### **Abstract:**

We consider shape optimization for objects illuminated by light. More precisely, we focus on time-harmonic solutions of the Maxwell system in **curl-curl**-form scattered by an arbitrary shaped rigid object. Given a class of cost functionals, including the scattered energy and the extinction cross section, we develop an adjoint-based shape optimization scheme which is then applied to two key applications:

- a) efficiency maximization of plasmonic nano-optical antennas
- b) optimization of scattering properties of nanoparticles