

Abstract Submitted  
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**Generic Design of an Invisibility Device**<sup>1</sup> PATTABHIRAJU MUNDRU, DENTCHO GENOV, Louisiana Tech Univeristy — A generic cloaking design based on realistic optical materials and existing nano-deposition techniques is proposed. A complete suppression of dipolar scattering is demonstrated by engineering cloaking systems encompassing two concentric shells. A transparency condition that does not depend on the object's geometrical and/or material properties using an expanded parametric space is proposed. The complete elimination of the system extinction cross-section is demonstrated in the quasi-static and full wave regime through use of non-dispersive and non-dissipative materials. Furthermore, a realistic shell designs based on composite metal/dielectric media is studied and the effect of loss and dispersion on the overall scattering cross-section is evaluated. It is shown that substantial reduction in the extinction cross-section (up to a factor of  $10^4$ ) can be achieved with pure dielectric materials in the optical and near-infrared spectral ranges. This study may provide a new direction for achieving optical invisibility without involvement of magnetism, i.e. metamaterials.

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