

Transformation Optics and Applications

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In the seminar, the speakers review the principles of optics transformation and give some examples of applications in optics and electromagnetics. The speakers present, for example, the experimental demonstration of a non magnetic cloak at microwave frequencies (1), an optical taper between two waveguides in both microwave and optical regimes (2), the practical implementation of a directive emission based on the transformation of an isotropic source at microwaves frequencies (3) and the inverse transformation of a directive source into an isotropic one (4). The speakers show how judiciously engineered metamaterials allow researchers to implement practical devices, with a good impedance matching between the radiating source, the material obtained by transformation optics and the vacuum.

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2. Ghasemi R., Tichit P.-H., Degiron, A., Lupu A., de Lustrac, A., (2010), Efficient control of a 3D optical mode using a thin sheet of transformation optical medium, *Optics Express*, vol. 18, num. 19, p. 20305.
3. Tichit, P.-H., Burokur, S. N. & de Lustrac, A., (2011), Design and experimental demonstration of a high-directive emission with transformation optics, *Phys. Rev. B.* 83, 155108. Preprint at <http://arXiv:1104.2529>.
4. Tichit P.-H., Burokur S. N., Qiu C. W., De Lustrac A., (2013), Experimental verification of isotropic radiation from a coherent dipole source via electric-field-driven LC resonator metamaterials, *Physical Review Letters*, vol. 111, p. 133901, 4 pages, 2013