

## 物理教室

21COE 物質階層融合科学 セミナー

物性コロキウム

日時： 2007年8月31日(金) 14:30~15:30

場所： 理学部 理学総合棟 745号室(大学院講義室I)

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題目： Effective  $\epsilon$  and  $\mu$  for metamaterial slabs – their retrieval from scattering matrix and properties

要旨：

Recently, a significant attention is devoted to the electromagnetic response functions of short period metallic-dielectric photonic crystals – *metamaterials*. It is believed, they can demonstrate so called *left-handed* behaviour: the refractive index may become negative, and unusual lensing (Veselago lense) becomes possible. Another exotic possibility is cloaking of objects from electromagnetic fields.

In my talk, I will analyse the retrieval of effective electromagnetic response of the metamaterials based on scattering matrix theory. The results will be illustrated on the examples of several metamaterial metal-dielectric structures, for which the negative refractive behaviour in near IR has been claimed in recent works. I will show that it is not possible to describe the response of the metamaterials in the optical region by effective local  $\epsilon$  and  $\mu$ . The electromagnetic response of metamaterials near the magnetic resonances is actually significantly nonlocal.

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