INVISIBILITY AND INVERSE PROBLEMS
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There has recently been considerable interest in the possibility, both theoretical and practical, of invisibility of objects to different types of waves. We construct several examples of cloaking enclosures covered with anisotropic materials. These examples have a close connection to earlier works carried out for the case of conductivity equation [1]. When the conductivity is not bounded from below, one can cover any object with a properly chosen anisotropic material so that the covered object appears in all boundary measurement similar to a domain with constant conductivity. Clearly, this kind of counter example gives us theoretical instructions how to cover an object so that it appears "invisible" in zero frequency measurements. In this talk we consider similar kind of result for all frequencies.

We review the results on the counter examples for Maxwell's and conductivity equations and consider in detail the existence of the finite energy solutions.

The results have been done in collaboration with A. Greenleaf, Y. Kurylev and G. Uhlmann, and with K. Astala and L. Päivärinta.

References:

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[3] A. Greenleaf, Y. Kurylev, M. Lassas, G. Uhlmann: Full-wave invisibility of active devices at all frequencies, Communications in Mathematical Physics 275 (2007), 749-789.

[4] K. Astala, M. Lassas, L. Päivärinta: Limits of visibility and invisibility in Calderon's problem, in preparation.