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Wave scattering by many small particles and applications

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The theory of wave scattering by many small impedance particles of arbitrary shapes is developed. The basic assumptions are: $a \ll d \ll \lambda$, where a is the characteristic size of particles, d is the smallest distance between the neighboring particles, λ is the wavelength. This theory allows one to give a recipe for creating materials with a desired refraction coefficient. One can create material with negative refraction: the group velocity in this material is directed opposite to the phase velocity. One can create a material with a desired wave focusing property. Quantum-mechanical scattering by much potential with small supports is considered. The theory presented in this talk is developed in [1]-[9]. Practical realizations of this theory are discussed in [9]. In [9] the problem of creating material with a desired refraction coefficient is discussed in the case when the material is located inside a bounded closed connected surface on which the Dirichlet boundary condition is imposed.

Biography

A.G.Ramm was born in USSR and immigrated to USA in 1979. He is a US citizen, professor of mathematics at KSU, an author of more than 660 papers in mathematical and physical Journals, of 15 monographs, and an editor of 3 books. His scientific interests include differential and integral equations, operator theory, mathematical physics, especially scattering theory and inverse problems, numerical analysis, especially methods for solving ill-posed problems, various problems of applied mathematics and theoretical engineering. Professor A.G.Ramm was awarded many honors, including Fulbright Research Professorships in Israel and Ukraine, Mercator Professorship, NATO and DAAD professorships and grants, Khwarizmi international award, distinguished professorships in some countries and distinguished lectureships of London Mathematical Society and Hong Kong Mechanical society, and many other honors and awards. He gave invited plenary talks at many conferences throughout the world.

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