Inverse Scattering at a Fixed Energy for Potentials that Are Asymptotic to a Sum of Homogeneous Terms

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We give a method to uniquely reconstruct the asymptotics at infinity of a potential that in the complement of a ball is a sum of homogeneous terms plus a term of faster decay, from the scattering data consisting of the integral kernel of the scattering matrix at a fixed positive energy in a neighborhood of the diagonal. If the potential is actually equal to a finite sum of homogeneous terms in the complement of a ball, a known theorem that proves that the scattering matrix at a fixed positive energy and the potential in the complement of a ball, uniquely determine the potential inside the ball, allows us to prove that the scattering matrix at a fixed positive energy uniquely determines a potential that is a sum of homogeneous terms in the complement of a ball. This is a joint work with Dimitri Yafaev, Université de Rennes I

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