



Mathematical Physics

# The uniqueness in the inverse problem for transmission eigenvalues for the spherically-symmetric variable-speed wave equation

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The recovery of a spherically-symmetric wave speed  $v$  is considered in a bounded spherical region of radius  $b$  from the set of the corresponding transmission eigenvalues for which the corresponding eigenfunctions are also spherically symmetric. If the integral of  $1/v$  on the interval  $[0, b]$  is less than  $b$ , assuming that there exists at least one  $v$  corresponding to the data, it is shown that  $v$  is uniquely determined by the data consisting of such transmission eigenvalues and their "multiplicities," where the "multiplicity" is defined as the multiplicity of the transmission eigenvalue as a zero of a key quantity. When that integral is equal to  $b$ , the unique recovery is obtained when the data contains one additional piece of information. Some similar results are presented for the unique determination of the potential from the transmission eigenvalues with "multiplicities" for a related Schrödinger equation.

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