



Mathematical Physics

# Spectral Singularities of a Complex Spherical Barrier Potential and Their Optical Realization

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The mathematical notion of a spectral singularity admits a physical interpretation as a zero-width resonance. It finds an optical realization as a certain type of lasing effect that occurs at the threshold gain. We explore spectral singularities of a complex spherical barrier potential and study their realization as transverse spherical electromagnetic waves emitted by a gain medium with a spherical geometry. In particular, for a typical dye laser material, we obtain a lower bound on the size of the gain medium for the occurrence of this kind of spectral singularities.

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