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On Spectra Measured in an Undulating Layered Medium

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ABSTRACT

Evidence has recently accumulated that stably stratified regions of the ocean and atmosphere often consist of a series of layers of nearly uniform density separated by steps in which the gradient is large. It is shown that the motion of this structure relative to a measuring instrument results in a spectral density proportional to $(\text{frequency})^{-2}$, over a range which is not limited by the overall value of the stability frequency N. Similarly, the spectra obtained by transversing such a structure is found to be proportional to $(\text{wavenumber})^{-2}$. Spectral forms of this type cannot necessarily be associated with spectral densities of either internal gravity waves or turbulent eddies.

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