

## Green's function retrieval from irregular noise: repairing the broken mirror

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The correlation of noise at two receivers is approximately proportional to the Green's function between these receivers. Hence, the correlation process turns one of the receivers into a virtual source, of which the response is observed by the other receiver. The virtual-source response is accurate when the medium is lossless and the noise field is equipartitioned. In practice these assumptions are often violated: the medium of interest is often illuminated from one side only, the sources may be irregularly distributed and losses may be significant. For those cases it is as if the virtual source is viewed in a broken (time-reversal) mirror, which causes a blurring of the source. This blurring is quantified by the so-called point-spread function which, like the correlation function, can be derived from the observed data (that is, without the need to know the actual sources and the medium). The broken mirror can be repaired by deconvolving the correlation function for the point-spread function. As a result the virtual source is refocused and hence the virtual-source response becomes more reliable. In the presentation I will illustrate the correlation and deconvolution methods with several examples and discuss the advantages and limitations of both methods.