

## ***Interactive comment on “Power Spectra of Random Heterogeneities of the Solid Earth” by Haruo Sato***

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Received and published: 23 November 2018

General comments: This is a very informative, compact and comprehensive paper that on the one hand summarizes some of the scientific achievements on seismic wave scattering that Haruo Sato has performed over the years, and at the same time puts many findings on the random heterogeneous structure inside the Earth and the Earth's materials from observations on many scales into a larger common perspective. There is short review of numerical methods to simulate wave envelopes, and their limitations. I like the flowchart figures which illustrate the similarities and differences between approaches without going into much detail. It is remarkable that it seems possible to describe statistical heterogeneity on scales ranging from rock samples to the lower mantle with one unified concept of power spectral density functions with power-law de-

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cay at high wavenumbers governed by just three parameters. And there is a hint that maybe even attenuation can be included into that framework to overcome the traditional separation between intrinsic absorption and scattering attenuation. Overall this paper makes pleasant reading and provides a bracket between many observations that can eventually form a step towards uniform description of the Earth's randomness. In this respect the paper not only is a concise short review of past research but also stimulates new ideas.

Specific comments: It could be stated more clearly that the measurements of heterogeneity listed in the Tables are by no means the only ones. Apart from that I don't have specific comments for improvement.

Technical corrections: p.2, L. 24: Correct: When the center wavenumber of a wavelet becomes much larger. . . p. 2, L. 34: delete “of this paper” p.3 L.8: characterized -> characterize p.3 L. 11: delete superscript of PSDF p. 7 L. 12: typo “directly the “ p.8 , L. 14: Two approximations -> The two approximations P. 9 Fig. 5 Typo distorted (2x) p. 10, L. 17: typo through p. 13, L. 2 put L16 and LS3 in brackets p. 13, L. 14: looks a sif an extension -> looks like an extension

Interactive comment on Solid Earth Discuss., <https://doi.org/10.5194/se-2018-109>, 2018.

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