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Submitted: 25 July 2014

Accepted: 14 January 2015

Published Online: 30 January 2015

Random flights through spaces of different dimensions

J. Math. Phys. **56**, 013512 (2015); https://doi.org/10.1063/1.4906808

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We shall study random flights that start in a space of one given dimension and, after performing a definite number of steps, continue to develop in a space of higher dimension. We show that if the difference of the dimension of spaces is even, then the probability density describing the composite flight can be expressed as marginalizations of the probability density associated to a random flight in the space of less dimensions. This dimensional reduction is a consequence of Gegenbauer addition theorem.

Acknowledgments

The authors would like to thank João C. A. Barata, Walter Wreszinski, and Alessandro De Gregorio for useful comments. This work was supported by FAPESP.

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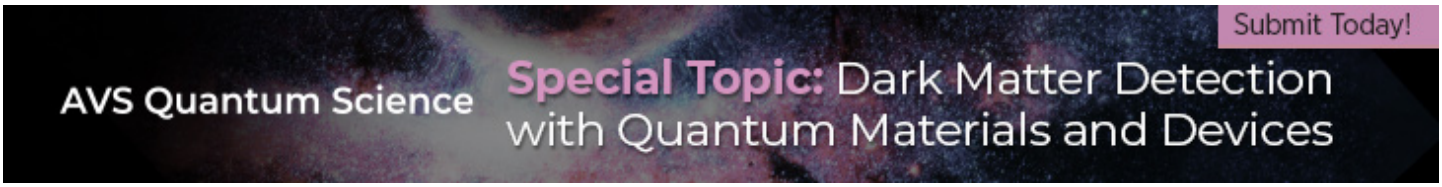

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