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Title:	Lefschetz thimbles and quantum phases in zero-dimensional bosonic models
Authors:	Bharathkumar, R. (/jspui/browse?type=author&value=Bharathkumar%2C+R.)
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| Abstract: | In this paper, by analyzing the underlyingLefschetz-thimble structure, we investigate quantum phases (or quantum critical points) in zero-dimensional scalar field theories with complex actions. Using first principles, we derive the thimble equations of these models for various values of the coupling parameters. In the thimble decomposition of complex path integrals, determination of the so-called intersection numbers appears as an important ingredient. In this paper, we obtain the analytic expressions for the combined intersection number of thimbles and anti-thimbles of these zero-dimensional theories. We also derive the conditional expressions involving relations among the coupling parameters of the model, that would help us predict quantum phase transitions in these systems. We see that the underlying thimble structure undergoes a drastic change when the system passes through such a phase transition. |

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