

Abstract Submitted  
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**Flat histogram diagrammatic Monte Carlo method: Motion of a hole in a columnar antiferromagnet** NIKOLAOS DIAMANTIS, University of Athens, EFSTRATIOS MANOUSAKIS, Florida State University — We will present a version of the diagrammatic Monte Carlo (Diag-MC) method in which we incorporate the flat histogram principle and we term the improved version “Flat Histogram Diagrammatic Monte Carlo” method. We demonstrate the superiority of the method over the standard Diag-MC in extracting the long-imaginary-time behavior of the Green’s function, without incorporating any *a priori* knowledge about this function, by applying the technique to the polaron problem. We have also applied the technique to the motion of a hole inside a  $J_1$ - $J_2$  quantum antiferromagnet with columnar order.

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