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Spectral properties of the one-dimensional Hubbard model: cluster dynamical mean-field approaches¹ ARA GO, GUN SANG JEON, Department of Physics and Astronomy, Seoul National University, Seoul 151-747, Korea — We investigate static and dynamic properties of the one-dimensional Hubbard model using cluster extensions of the dynamical mean-field theory. It is shown that the two different extensions, the cellular dynamical mean-field theory and the dynamic cluster approximation, yield the ground-state properties which are qualitatively in good agreement with each other. We compare the results with the Bethe ansatz results to check the accuracy of the calculation with finite sizes of clusters. We also analyze the spectral properties of the model with the focus on the spin-charge separation and discuss the dependency on the cluster size in the two approaches.

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