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**Spectral function of the ionic Hubbard model (IHM)** SINAN BULUT, BILL ATKINSON, Trent University — Using two-pole approximations, which are based on the equation of motion method, we calculate the excitation spectrum of the one dimensional IHM. To be specific, we use the composite operator method and the Roth-approximation. Though very simple in nature, these approximations capture the physics of the IHM qualitatively at least. As is predicted by several other numerical and/or theoretical studies, a *bond-order* (BO) *phase* is given by these approximate methods. In the BO phase, atoms in the system are dimerized leading to a gap in the excitation spectrum. We find that the BO phase flattens both low and high-energy bands. When the BO phase is suppressed, however, the system can be driven from the band-insulating phase to the metal one by electron-electron repulsions, which is somewhat counter-intuitive. Additionally, two-pole approximations generate a reasonably good DOS spectrum of this model when compared with exact numerical results for small systems.

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