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High-performance computational condensed-matter physics in the cloud[1] J.J. REHR, L. SVEC, J. P. GARDNER, M. P. PRANGE, U. of Washington — We demonstrate the feasibility of high performance scientific computation in condensed-matter physics using *cloud computers* as an alternative to traditional computational tools. The availability of these large, virtualized pools of compute resources raises the possibility of a new compute paradigm for scientific research with many advantages. For research groups, cloud computing provides convenient access to reliable, high performance clusters and storage, without the need to purchase and maintain sophisticated hardware. For developers, virtualization allows scientific codes to be pre-installed on machine images, facilitating control over the computational environment. Detailed tests are presented for the parallelized versions of the electronic structure code SIESTA [2] and for the x-ray spectroscopy code FEFF [3] including CPU, network, and I/O performance, using the the Amazon EC2 Elastic Cloud.

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[2]J. Soler et al., J. Phys.: Condens. Matter **14**, 2745 (2002).
[3]A. Ankudinov et al., Phys. Rev. B **65**, 104107 (2002).

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