Editor’s review 1:

You might note that eqn 5 does not match the experimental data for the one electron atomic ions because the Z^4 relativistic correction swamps this effect. The non-adiabatic effect is roughly linear in Z because M is almost linear in Z, 1-mu = 1/(M+1)~ 1/Z.

Response to Editor’s review 1:

We have added a sentence in the manuscript stating this fact.

Editor’s review 2:

There is more interest in the change in the correction with R for diatomics. For H2 we know this is small compared to the actual correction. From your data you could estimate the contribution to the dissociation energy using the non-adiabatic correction your diatomic and atomic energies. You could also estimate the correction to the vibrational frequency.

Response to Editor’s review 2:

We do not have sufficient data to calculate the correction with R, which we assume to be the inter-nuclei distance for the diatomics. We have calculated the nonadiabatic correction to the disassociation energies and included them in Table IV. We are not sure how we can estimate the correction to the vibrational frequency of the diatomics from our current data.

Review 1:

I find the paper to be acceptable for publication after addressing the small number of minor issues below. Minor comments and/or suggests are as follows:

Pg. 2 The abbreviation ECG appears to be undefined at this point in the text. Please define. I assume it means “explicitly correlated Gaussian”.

Pg. 4 Sometimes the term “non-adiabatic” appears in the text and other times it uses “nonadiabatic”. Please be consistent.

Pg. 6 “Finding accurate reference data…is not straightforward. We will use highly converged ECG data when available.” Break the sentence for the sake of improving the readability.

Pg. 7 In the title to Table II it should be made clear that both the total energies and dissociation energies are given in Hartrees. It’s relatively unconventional to report De values in Hartrees.

Pg. 9 An extraneous lower case “p’ appears in reference 57.

Response to Review 1:

Pg. 2 (explicitly correlated Gaussian) has been added after ECG.

Pg. 4 All occurrences of “non-adiabatic” have been replaced with “nonadiabatic”.

Pg. 6 This sentence has been broken in half.

Pg. 7 We now explicitly state in the caption of Table II that “Both total energies and dissociation energies are given in units of Hartree”.

Pg. 9 The typo in the reference has been corrected.

Review 2:

This is a careful study of the handling of non-Born-Oppenheimer electron-nuclear interactions within the realm of Monte Carlo simulations.

Response to Review 2:

Thank you.