Relativistic correction to the static potential at $O(1/m)$

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An alternative strategy for computing heavy quarkonium spectra is to solve the Schrödinger equation with the interquark potential including relativistic corrections. In potential NRQCD, the correction at $O(1/m)$ is expected as well as the spin- and velocity-dependent potentials at $O(1/m^2)$. We investigate the $O(1/m)$ correction in SU(3) lattice gauge theory with the multi-level algorithm. We find that the correction is comparable with the Coulombic term of the static potential when applied to charmonium, and amounts to one-fourth of the Coulombic term for bottomonium.