Long-range interactions between two excited helium atoms\textsuperscript{1} J.-Y. ZHANG, Z.-C. YAN, Department of Physics, University of New Brunswick, Fredericton, New Brunswick, Canada E3B 5A3, D. VRINCEANU, T-4 Group, Los Alamos National Laboratory, Los Alamos, New Mexico 87545, USA, J.F. BABB, H.R. SADEGHPOUR, ITAMP, Harvard-Smithsonian Center for Astrophysics, Cambridge, Massachusetts 02138, USA — Using variational wave functions in correlated Hylleraas coordinates, we have precisely calculated the dispersion coefficients $C_n$ (with $n$ up to 10) for the long-range interaction between two excited helium atoms including the effect of finite nuclear mass. In this work, the long-range interaction coefficients reported are $C_3$, $C_6$, $C_8$, $C_9$, and $C_{10}$ for He($2^1S$)–He($2^1P$); $C_6$, $C_8$, and $C_{10}$ for He($2^3S$)–He($2^1P$); and $C_5$, $C_6$, $C_8$, and $C_{10}$ for He($2^1P$)–He($2^3P$) and He($2^1P$)–He($2^3P$) for the $\Delta$, $\Pi$, and $\Sigma$ molecular states.

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