Van der Waals forces between nanoclusters: importance of many-body effects

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— Van der Waals (VDW) interactions between nanoclusters have been calculated using a self-consistent, coupled dipole method. The method accounts for all multi-body (MB) effects and can be used to calculate dispersion interaction energies between nanoclusters of arbitrary shape. Comparison is made between the exact potential energy, $V$, and the values obtained with two alternative methods: $V^{(2)}$, a sum of two-body interactions, and $V^{(2)} + V^{(3)}$, the sum of 2-body and 3-body interactions. For some clusters and orientations, $V^{(2)}$ is close to the exact result. In other situations, MB effects can be large. For all cases considered here, the 3-body term alone does not accurately represent the MB contributions to $V$. MB contributions are especially important for shape-anisotropic clusters.