# Direct Measurements of Dipole-Induced Dipole Interactions

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Colloidal particles are often used to mimic and simulate the complex behaviors of atoms or molecules because the time and length scales with the use of the colloidal dispersion are significantly delayed to the level that can be observed directly with conventional instrument. In addition, the electrostatic interactions between molecules are analogues to those between colloids, whereas the magnitude of the interaction force of the colloids is amplified, thereby enabling the direct force measurements with state-of-the-art technologies. Although the fact that the permanent dipole generates the induced dipole is well documented in many basic textbooks, experimental studies with regard to the permanent dipole-induced dipole interaction and the proof of the scaling behavior (i.e., $r^{-6}$ dependence) have not been reported yet. This work is the first experimental demonstration of the power-law behaviors of the dipole-induced dipole (D-I) interactions in the colloid level.