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Light-induced structure transformation of colloidal nanocrystals by using generalized Ewald-Kornfeld formulation[1] M.J. ZHENG, K.L. CHAN, K.W. YU, The Chinese University of Hong Kong — When metallic nanoparticles are brought close together and they are illuminated by laser light, there will be strongly enhanced forces between these particles [1]. If these particles are suspended in a liquid, the force can promote aggregation. As a result, the cluster size can exceed the wavelength of light and retardation effect must be considered. For this sake, we derived a generalized Ewald- Kornfeld summation [2] which is valid for fully retarded electromagnetic interaction. More importantly, we have extended the formula for a many-point basis in a unit cell. We used the formula to study the colloidal nanocrystal formation and transition driven by surface plasmon resonance enhanced forces. Our results are of fundamental importance to the relevant topics in soft matter physics and can be widely applied in the research of light-induced manipulation.

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