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【454】 Quantum dynamics of nano-rings of dipole-coupled emitters

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A single ring of sub-wavelength spaced dipole-coupled quantum emitters possesses only few radiant but many extraordinarily subradiant collective modes. These exhibit a 3D-confined spatial radiation field pattern forming a nano-scale high-Q optical resonator. Proven to show promising results in the single-ring case, a spin-wave Ansatz was chosen to investigate the radiation properties of double-ring structures. It has been found that the wave function is composed of two spin-waves with equal or opposite phase, allowing us to study the rich behaviour of the super- and subradiant properties of these eigenmodes and proceeding to analyse the collective eigenmodes of light-harvesting complexes in purple photosynthetic bacteria analytically.

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