Anisotropic magnetic coupling of permalloy micron dots forming a square lattice

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Static magnetic and spin wave properties of square lattices of permalloy micron dots with thicknesses of 500 and 1000 Å and with varying dot separations have been investigated. A magnetic fourfold anisotropy was found for the lattice with dot diameters of 1 μm and a dot separation of 0.1 μm. The anisotropy is attributed to an anisotropic dipole–dipole interaction between magnetically unsaturated parts of the dots. The anisotropy strength (order of 10^5 erg/cm^3) decreases with increasing in-plane applied magnetic field.