

### Fabrication of magnetic metal dot pattern using CL

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Several self-assembly techniques employing colloidal particles have been used to create 2D patterns. Well organized 2D particle arrays are of practical significance for the applications in photonic crystal, microlense, and colloidal lithography. We report on a new method to control the size of magnetic metal dot using monodisperse colloid as mask and analysis magnetic property of the magnetic metal dot by using magneto optical microscope magnetometer (MOMM). The diameter of monolayer PS film deposited on Co/Pd multilayer could be tuned by reactive ion etching condition. Magnetic metal dot patterns with a diameter of 80-350nm and thickness of 30 nm were made by colloidal lithography on silicon wafer. Our initial magnetic film was a highly uniform Co-terminated (2Å Co/ 11Å Pd)10 multilayer structure. This gives a very square hysteresis loop. Large area monolayer PS film close packed into FCC structure was prepared by spin coating method on Co/Pd multilayer. After RIE was performed with 3:2 a mixture of O<sub>2</sub> and CF<sub>4</sub> at power density of 80 W, each diameter of 366, 200 nm polystyrene monolayers was gradually reduced as the RIE time increased. These sizes were identified by scanning electron microscopy (SEM).