Magnetic structure of artificial spin ice

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Arrays of dipolar coupled ferromagnetic nanostructres (artificial kagome spin ice) were produced using lift-off electron beam lithography and ultrahigh vacuum magnetron sputtering of permalloy ($Ni_{80}Fe_{20}$) films. The topologies of the structures were examined by: scanning electron microscopy, photoelectron microscopy (PEEM), and atomic force microscopy. Magnetic structures were observed with PEEM employing the XMCD effect and with magnetic force microscopy. The specific features of magnetic structure characteristic for artificial spin ice were recorded with both methods.