

## **Patterned magnetic multilayer studied by X-ray PEEM**

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In advance material research, the exchange coupled magnetic thin films is a subject under intensive study. From material engineering point of view, a system with tunable properties through adjusting its macroscopic parameters such as film thickness and lateral dimensions is attractive for its quick turn around time. To gain a fundamental understanding on such correlation, however, it requires additional insight other than the measurement of averaged response. Indeed, recent studies on the coupled magnetic thin film layers have observed clear variation in the domain size as well as their magnetization orientations due to the competition between in-plan and out-of-plan magnetization when the film thickness is changed [1-2]. Similarly, the domain structures in coupled sandwich structure, NiFe/Rh/NiFe, were found to be in different dimensions depending one whether the coupling is ferromagnetic or antiferromagnetic [3]. In this study, we use X-ray photoemission electron microscope to study the domain structures of exchange coupled Co/Cu/Co/Cu(100) system that is patterned into micron sizes. The Co layers in this sandwich structure is known to exhibit oscillatory interlayer coupling as a function of Cu spacer layer thickness [4], and the patterned Co/Cu(100) has different domain structure comparing with the continuous film. By varying the geometrical dimensions and individual layer thickness, we study the domain structures of patterned multilayer system.

### **References**

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