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Spin Wave Quantization by the Stripe Domain Structures in a Continuous Film CHUN-YEOL YOU, SEUNG-SEOK HA, JUNGBUM YOON, SUKMOCK LEE, Dept. of Phys. Inha University, MYUNG-HWA JUNG, Dept. of Phys. Sogang Univ., YOUNG KEUN KIM, Deparment of Materials Science and Engineering, Korea University — Abnormal field dependence and dispersion relations of spin wave excitation spectra in the Brillouin light scattering were observed in a continuous CoFeSiB film. The observed spectra are similar to spin wave quantization in laterally-confined magnetic structures such as arrays of magnetic nanowires. In the array of nanowires, the propagating spin wave formed a standing wave due to the reflection from the geometrical confinement, boundaries of the nanowire, and the spin wave exciting modes are quantized. In our observation, the possible reflection source in the continuous CoFeSiB film is the regular domain boundaries, domain walls. As evidence, we observed very regular stripe domain structures by magnetic force microscopy. In the low field region (¡1 kOe), the regular stripe domain patterns are formed and additional spin wave excitations are observed, while in the large field region, it behaves as usual continuous film. We believe that the regular domain wall acts as a scattering source of the spin wave, and it causes spin wave mode quantization.

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