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Room-temperature creation and spin-orbit torque-induced manipulation of skyrmions in thin film GUOQIANG YU, PRAMEY UPADHYAYA, XIANG LI, WENYUAN LI, Electrical Engineering, UCLA, SE KWON K IM, Physics and Astronomy, UCLA, YABIN FAN, KIN L. WONG, Electrical Engineering, UCLA, YAROSLAV TSERKOVNYAK, Physics and Astronomy, UCLA, PEDRAM KHALILI AMIRI, KANG L. WANG, Electrical Engineering, UCLA — Magnetic skyrmions, which are topologically protected spin texture, are promising candidates for ultra-low energy and ultra-high density magnetic data storage and computing applications1, 2. To date, most experiments on skyrmions have been carried out at low temperatures. The choice of materials available is limited and there is a lack of electrical means to control of skyrmions. Here, we experimentally demonstrate a method for creating skyrmion bubbles phase in the ferromagnetic thin film at room temperature. We further demonstrate that the created skyrmion bubbles can be manipulated by electric current. This room-temperature creation and manipulation of skyrmion in thin film is of particular interest for applications, being suitable for room-temperature operation and compatible with existing semiconductor manufacturing tools. 1. Nagaosa, N., Tokura, Y. Nature Nanotechnology 8, 899-911 (2013). 2. Fert, A., *et al.*, Nature Nanotechnology 8, 152-156 (2013).

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