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An *in-situ* Study of Martensitic Transformation in Shape Memory Alloys using PEEM GANG XIONG, T. DROUBAY, A. JOLY, W. HESS, Pacific Northwest National Laboratory, Richland, WA 99352, USA, M. CAI, S. LANGFORD, J. DICKINSON, Physics Department, Washington State University, Pullman, WA 99164 USA, M. WU, Q. HE, W. HUANG, School of Mechanical Production Engineering, Nanyang Technological University, 50 Nanyang Ave., Singapore — The thermally-induced martensitic transformation in a polycrystalline CuZnAl and NiTi thin film shape memory alloy (SMA) was probed using photoemission electron microscopy (PEEM). Ultra-violet photoelectron spectroscopy (UPS) measurements indicate that the apparent surface work function changes reversibly during transformation, presumably due to the contrasting electronic structures of the martensitic and austenitic phases. *In situ* PEEM images provide information on the spatial distribution of these phases and the microstructural evolution during transformation. The evolution of the photoemission intensities obtained from PEEM images during transformation can provide quantitative information on fractional percentages of austenite and martensite phases as the transformation proceeds. PEEM offers considerable potential for improving our understanding of martensitic transformations in shape memory alloys in real time.

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