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Transmission Electron Microscopy of Charge Density Wave Transitions of rare-earth transition-metal silicide $R_5Ir_4Si_{10}$ ($R=Dy, Ho$). C.H. CHEN, C.M. TSENG, Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan, H.D. YANG, Department of Physics, National Sun-Yat-Sen University, Kaohsiung, Taiwan — The metallic ternary rare-earth transition-metal silicides of $R_5Ir_4Si_{10}$ where $R=(Dy, Ho)$ exhibit charge density wave (CDW) transitions despite its seemingly three-dimensional crystal structure. In this talk we present the observation of the CDW phase transitions in this class of materials by electron diffraction and electron microscopy. These compounds exhibit incommensurate to commensurate phase transitions as temperature decreases. The modulation wave vector is found to be along the c -axis of the crystal with a modulation periodicity approximately four times of the unit cell. Real space imaging of CDW domains and/or domain walls using the dark-field technique in transmission electron microscopy will also be presented.

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