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Effect of Pressure on the Competition between Charge Density Wave and Superconductivity in $ZrTe_3$ Single Crystal Y. UWATOKO, M. ABLIZ, M. HEDO, ISSP, Univ. of Tokyo, Kashiwa, Chiba 277-8581, Japan, R. YOMO, K. YAMAMYA, Dept. of Appl. Phys., Hokkaido Univ., Sapporo 060-8628, Japan — Competition and coexistence of CDW and superconductivity are studied from ancient times by $NbSe_2$, $NbSe_3$, etc. The rivalry of CDW and superconductivity was changed with pressure and the method of investigating the situation has been used. We report on an intricate competition between charge density wave (CDW) formation and superconductivity under pressure up to 11 GPa in the low-dimensional conductor $ZrTe_3$. The electrical resistivity measurements up to 11 GPa in the temperature 2.4K to 300K were performed using a standard 4-probe method. Hydrostatic pressure was produced by using a cubic anvil pressure cell in the Teflon cell filled with a fluid pressure transmitting medium of mixture of Fluorinert. As pressure increases, the CDW transition temperature T_{CDW} initially increases, then begins to decrease at 2 GPa and abruptly disappears near 5 GPa. On the other hand, while the superconducting transition temperature T_C falls to below 1.2 K at $\sim$0.5 GPa and is not observed at up to 5 GPa above 2.5 K, a superconducting transition emerges beginning at $\sim$5 GPa and T_C increases steeply up to 11 GPa. This is an observation of pressure-induced reentrant superconductivity. The results are discussed in terms of the change in the reduced area of the Fermi surface due to CDW formation.

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