COMPLEX MARTENSITIC MICROSTRUCTURES IN TI76NB22AL2

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Remarkable martensitic microstructures are observed in the alloy Ti76Nb22Al2, which undergoes a cubic to orthorhombic transformation with six martensitic variants $U_i = U^T i > 0$ having middle eigenvalue $\lambda_2(U_i)$ very close to 1. Assuming that $\lambda_2(U_i) = 1$ there are exactly 12 matrices in the set of energy wells $\bigcup_{i=1}^{6} SO(3)U_i$ that are rank-one connected to 1. This set of 12 matrices has no rank-one connections. We attempt to understand the observed microstructures by studying gradient Young measures, exact gradients and TN -configurations supported on these 12 matrices. This is joint work with Tomonari Inamura and Francesco Della Porta