

**Effects of Laminate Misalignment on Thermoelastoviscoplastic Properties
of Ultrafine Plate-Fin Structures**

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In this study, effects of laminate misalignment on the thermoelastoviscoplastic properties of ultrafine plate-fin structures are investigated using a homogenization theory for thermoelastoviscoplasticity. For this, the homogenization theory for time-dependent materials is combined with the homogenization theory for thermoelasticity. Moreover, the substructure method is introduced into the theory to deal with the randomness of laminate misalignment in ultrafine plate-fin structures. The present method is then applied to the analysis of thermoelastoviscoplastic behavior of ultrafine plate-fin structures made of a Ni-based alloy with laminate misalignment subjected to a macroscopic temperature increment. The results reveal the effects of the laminate misalignment on the macroscopic and microscopic thermoelastoviscoplastic properties of ultrafine plate-fin structures.

Keywords: Plate-fin structure, Laminate misalignment, Randomness, Thermoelastoviscoplasticity, Thermal stress, Homogenization