

Fatigue accumulation in oscillating thermoelastoplastic structures with hysteresis - part I (modelling)

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We propose a model for fatigue accumulation based on the hypothesis that there exists a proportionality between fatigue and dissipated energy.

We demonstrate our model on the examples of a transversally oscillating elastoplastic beam and plate. The full system consists of the momentum and energy balance equations, and an evolution equation for the fatigue rate. In this first part we prove the thermodynamic consistency of the model problem.

References

- [1] *Michela Eleuteri, Jana Kopfová, Pavel Krejčí*: A thermodynamic model for material fatigue under cyclic loading. Proceedings of the 8th International Symposium on Hysteresis and Micromagnetic Modeling, Physica B: Condensed Matter 407, no. 9 (2012).