Szwed, Aleksander; **Kamińska, Inez**
Explicit form of yield conditions dual to a class of dissipation potentials dependent on three invariants. (English) ⟨Zbl 07410775⟩
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This paper explores and presents the methodology to find the dual yield condition associated with a given dissipation potential. The development is for isotropic perfectly plastic solids, and the dissipation potential is assumed to be a function of three cylindrical invariants. The paper highlights the techniques involving the Legendre transformations that have been employed to obtain these dual formulations. The paper presents a detailed list of references for the other related research works existing in the literature to follow the mathematical development in the paper in a clear and concise manner. The paper is quite mathematical, but it is easier to understand the contents and the mathematical derivations as the authors include a detailed derivation of mathematical formulae with appropriate explanations. These derivations are limited to the case of plastic flow with zero plastic rate. The examples of dual potentials and relationships include the generalized Beltrami, generalized Drucker-Prager, and generalized Mises-Schleicher dissipation potentials. It is useful to note that the presented methodology can be extended to other existing and new models employing all three invariants. The reviewer believes the paper to be interesting and useful for the intended audiences.

Reviewer: Vinod K. Arya (Dallas)

MSC:

74C05	Small-strain, rate-independent theories of plasticity (including rigid-plastic and elasto-plastic materials)
74A20	Theory of constitutive functions in solid mechanics

Keywords:

dual yield condition; dissipation potential; isotropic perfect plasticity; Legendre transform

Full Text: DOI

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