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**Title:** A family of systems including the Herschel-Bulkley fluid equations

**Abstract:** To a family of systems with a “power law stress tensor” which includes models for visco-plastic fluids (more generally, Bingham fluid equations/Herschel-Bulkley type equations), we use some basic facts on Convex Analysis to show that the tensor is the sub-differential of a convex function. Consequently, it defines a monotone operator. The convexity and monotonicity help to prove the existence of a solution to the system of equations.

This is a joint work with Anderson L. A. de Araujo (UFViçosa, Brazil) and Nikolai V. Chemetov (USP, Brazil).