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# RECENT PROGRESS IN PLASTICITY

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## Abstract

This paper intends to provide a brief overview of recent progress in plasticity. Different types of theories for finite strain plasticity have been explained. The significant developments on micromechanics of plasticity made it possible to get a rather comprehensive constitutive theory of crystalline material. An exact kinematical theory for the crystal plastic deformation is introduced. The latent hardening is described as an important feature for the slip-plane hardening.

The method which can be used to get the macroscope behavior of an aggregates of micro-elements has been reviewed. The self consistent theory proposed by Hill is summarized. The micro-plasticity for multi-phase media is also presented.

The thermodynamics of plasticity is a basic problem in the thermodynamics of irreversible process. The theory of internal variable is an attractive model. But there are many controversies in this field. A critical review is given in this paper.

**Keywords** *Plasticity; finite strain; micromechanics; crystal; thermodynamics of irreversible process; internal variable*

## 模拟水分亏缺加剧期间大豆作物水分关系和蒸腾量的日变化

**提要** 表述了大豆作物蒸腾量的一个新模型，并用数值法进行了求解。此模型特别包括了植株中的储水量。描述了水分亏缺加剧时蒸腾量、气孔行为、叶水势和叶温在一天中的变化。计算了叶水势的值（图3）和蒸腾量的值（图5），同灰裂粘土中生长的大豆作物在水分亏缺加剧期间的观测值相比很符合。

**董务民**译自：Kowalik P.J., Turner N.C., *Irrigation Sci.*, **4**, 4 (1983) : 225—238. 参36