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**Elastic solids with many cracks and related problems.** (English) Zbl 0803.73057  
Adv. Appl. Mech. 30, 259-445 (1994).

From the introduction: This review discusses some basic problems in mechanics of elastic solids containing multiple cracks. The problem considered can be divided into two groups.

1. The impact of interactions on individual cracks, particularly on the stress intensity factors. Interactions can produce a variety of phenomena – stress shielding and stress amplification, coupling of the normal and shear modes, etc. The configuration of a macrocrack interacting with a field of microcracks is of particular interest for materials science applications.
2. The effective elastic properties of solids with many cracks. This is a classical problem of continuum mechanics; it also has applications in materials science, structural mechanics, geophysics and serves as a background of some nondestructive evaluation techniques.

Problems of the first group are, generally, relevant to the fracture- related considerations; solutions are sensitive to the positions of individual cracks. Problems of the second group deal with the volume average quantities; they are relatively insensitive to the information on individual cracks. We discuss, in this connection, whether correlations exist between these two groups of quantities; in particular, whether microcracking can be reliably monitored by measuring changes in the effective elastic moduli.

For the entire collection see [\[Zbl 0788.00040\]](#).

**MSC:**

[74R99](#) Fracture and damage  
[74B05](#) Classical linear elasticity

Cited in **64** Documents

**Keywords:**

[interactions](#); [individual cracks](#); [stress intensity factors](#); [effective elastic properties](#); [volume average quantities](#); [microcracking](#)