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Variational inequalities and flow in porous media. (English) Zbl 0544.76095

Applied Mathematical Sciences, 52. New York etc.: Springer-Verlag. VII, 118 p. DM 44.00; \$ 16.10 (1984).

This small lecture note consists of four chapters. It is mainly concerned with the regularity theory for obstacle and dam problems, from the point of view of variational inequalities. The first two chapters summarize some ideas of the functional analysis and the variational inequalities with some applications from physical mathematics. The third chapter is concerned with a regularity theory for the obstacle problem. Results for one and two obstacles are combined in a unified way. The fourth chapter is concerned with the dam problem. There is an excessive use of mathematical symbols many of which could have been avoided for smooth reading. Physical ideas have been over-shadowed by mathematical complexity, and hence the practical scientists interested in the topic of the flow through porous media will find the book difficult to read. However, a pure mathematician will surely find delight in reading the book.

Reviewer: [G.Paria](#)

MSC:

- [76S05](#) Flows in porous media; filtration; seepage
- [35J20](#) Variational methods for second-order elliptic equations
- [76-02](#) Research exposition (monographs, survey articles) pertaining to fluid mechanics
- [49J40](#) Variational inequalities

Cited in **1** Review
Cited in **50** Documents

Keywords:

Dirichlet problem; penalty method; monotonicity; elastic-plastic torsion; regularity theory for obstacle and dam problems; variational inequalities