MODELS IN HYSTERESIS

G. Tronel

Laboratoire d'Analyse Numérique,
C.N.R.S. et Université Pierre et Marie Curie,
B.C. 187, 4 place Jussieu, 75252 Paris Cedex 05, France

Hysteresis phenomena occur in many domains of science: physics - electromagnetism, ferroelectricity, - mechanics // friction, plasticity, - chemistry // adsorption, desorption, etc.The fundamental problems were and are the construction of the mathematical models. In the second part of the last century we can say that the M.A. Krasnoselskii's group, in Moscow, has given the basic fundations of mathematical theory of hysteresis. The basic models are:the "play" and the "stop" models; the phase transition models, the "catastrophic" models. In fact the so called "one dimensional hysteresis" is well known, but there are many open problems in multidimensional cases, in particular the constrution of geometrical models.

In this talk I shall give only basic facts concerning the definitions, the properties, and few mathematical models in one dimensional hysteresis.

R e f e r e n c e s

[1] Krasnoselskii, M. A., Pokrovskii, A.V.: Systems with Hysteresis. Springer, Berlin1989. Russian edition: Naouka, Moscow 1983.

[2] Visintin A. : Differential Models of Hysteresis. Springer, Berlin 1994.

[3] Brokate, M., Sprekels J.: Hysteresis and Phase Transitions. Springer, Berlin 1996.