Mathematical Modeling of Switching Processes in Magnetically Controlled MEMS Switches

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Abstract : The operating principle of magnetically controlled microelectromechanical system (MEMS) switches is based on controlling the beam movement under the influence of a magnetic field. Currently, there is a MEMS switch design with a flexible ferromagnetic electrode in the form of a fixed-terminal beam, with an electrode fastened on a straight or cranked anchor. The basic performance characteristics of magnetically controlled MEMS switches (service life, sensitivity, contact resistance, fast response) are largely determined by the flexible electrode design. To ensure the stable and controlled motion of the flexible electrode, it is necessary to provide the optimal design of a flexible electrode.