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Abstract
Many small scale image display systems, such as head mounted displays (HMDs), beam light from an optical fiber onto deflectable mirrors or rotating polygonal mirrors to produce an image on an image plane. This approach has many size limitations. For instance, light beams of less than 3 millimeter (mm) are impractical for displays using mirrors, because mirror scanners and grating deflectors must be significantly larger than the light beam diameter to avoid clipping the beam or adding diffraction. Reducing the diameter of a conventional display device reduces the possible number of pixels, and thus reduces the resolution and/or field of view (FOV) of the device.
Here we present a MEMS based 2-D micro image display device that can potentially overcome the size reduction while maintaining the same image resolution and field of view. The basic design of the optical scanner includes a micro-fabricated polymer based cantilever waveguide that is Electromechanically deflected by a 2-D thin film actuator. From the distal tip of the cantilever waveguide, a light beam is emitted and the direction of propagation is displaced along two orthogonal directions. Preliminary display results have been obtained using the optical sensor. Simple text message using this micro display system will be presented.
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